ARTICLE 1: Common Modality Effects in Immediate Free Recall and Immediate Serial Recall

METHODS

Forty participants from the University of Essex took part in this experiment. There were five males and 35 females ranging from 18 to 39 years of age. The mean age was 20.8 years (standard deviation

4.2). All participants confirmed that they were fluent in English.

The materials consisted of a subset of 440 words that were randomly selected for each participant from the Toronto Noun Pool (Friendly, Franklin, Hoffman, & Rubin, 1982). Audio file versions of each word were obtained from Michael Kahana’s Computational Memory Laboratory web site (Kahana, 2010; http://memory.psych.upenn.edu/WordPools). The shortest sound file was 0.350 s; the longest sound file was 0.860 s. Audio files were presented via a Logitech USB Headset 4.330 at a volume comfortable to each participant. The words were presented in 60-point Times New Roman font. The materials were presented on an Apple eMac computer monitor using the Supercard application.

The experiment used a mixed design. The betweensubjects independent variable was the task with two levels (ISR or IFR). There were three within-subjects independent variables: modality with two levels (visual and auditory), list length with seven levels (two, four, five, six, seven, eight, and 12), and serial position with up to 12 levels (serial position 1–12). The main dependent variables were the proportion of words recalled in any order (FR scoring), the proportion of words recalled in the correct serial position (SR scoring), and the probability of initiating recall with the very first list item—that is, Probability of First Recall (PFR)

Serial Position 1.

Participants were tested individually and informed that they would be shown two practice lists, of seven words each, followed by 70 experimental lists of words. Participants were allocated to one of two groups: either the ISR group (where they should remember the words in the correct order), or the IFR group (where they can remember the words in any order). The two practice trials consisted of one visual trial and one auditory trial. The experimental trials were split into two equal blocks of 35 trials each. Each block consisted of only visual trials or auditory trials. The order of the blocks was counterbalanced across participants. In all conditions, the order of the list lengths was randomized, such that each block contained five repetitions of each list length. Participants were not aware of the length of the list in advance of its presentation.

DISCUSSION

A third feature of our data that may constrain unified accounts of modality effects is that the magnitude of modality differences is greatest when participants initiate their recall from the start of the list. This suggests that a major factor in determining the modality effect in both IFR and ISR is the greater resistance to output interference observed with auditory stimuli (including visual words that are read aloud) relative to words in the visual silent presentation condition (Cowan et al., 2002, 2004). One explanation for the resilience of auditory items within our data sets is that auditory words are stored with more enriched sets of features than visual items (e.g., Nairne, 1990; Neath, 2000), and that recalled list items interfere with the recall of as yet to-be-remembered items. If we further assume that the internalized voice that accompanies silent written recall at output is more similar to the internalized voice that accompanies covert phonological recoding in the visual silent presentation condition, then as recall progresses the differences in the effect of subsequent recalls (output interference) on visual relative to auditory yet-to-be-recalled items will increase.

A fourth and final feature of our data that may constrain unified accounts of IFR and ISR is the confirmation of inverse modality effects (Beaman, 2002; Macken et al., 2016): visual recall advantages that occur in early mid serial positions with medium to long list lengths. Consistent with Macken et al. (2016), we assume that the modality of presentation affects the way that all the list items are processed. We agree that presenting stimuli in the visual silent conditions may be more conducive to cumulative forward-ordered rehearsal than visual read aloud as the former but not the latter is unimpeded by the need to articulate or vocalize each currently presented item. We are also willing to accept that participants might either feel a greater necessity to rehearse the visual silent items relative to the words in the auditory condition in order to form groups or subsequences of lists and/or be less able to incorporate the current auditory presented word into a cumulatively expanding rehearsal set. The benefits of cumulative forwardordered rehearsal may be greatest not at the start of the list but at early mid list positions (see Grenfell-Essam et al., 2013), and the benefit may be greatest at longer list lengths, where there might be both greater rehearsal opportunities and where the difficulty in recalling unrehearsed early list items might be more difficult (see Ward, 2002). Currently, many contemporary accounts of IFR and ISR (e.g., the SIMPLE model, Brown et al., 2007; the feature model, e.g., Nairne, 1990; Neath, 2000; and the Farrell, 2012 model) do not incorporate an account of rehearsal. However, our data suggest that recall of read aloud stimuli is reasonably similar to the recall of auditory stimuli, and we do not find the lowered levels of overall performance observed in the read aloud conditions of Macken et al. (2016). Of course, there are many differences between the methodologies used in our study and that of Macken et al. (2016). Most notably, we used different tasks, an experiment-unique set of stimuli, words rather than consonants and a rate of presentation of one word per second that was slightly slower than that standardly used by Macken et al. (2016; 750 ms per word).

Our preferred explanation of our data is that the modality of presentation affects the processing of the entire list of items. We assume that longer lists are parsed into multiple groups (of varying sizes), and the presentation of each auditory (or read aloud) item leads to a set of more richly encoded features than those encoded following the presentation of each visual silent item. The modality of presentation does not affect the PFR, as each item within the same modality in the list is encoded with the same richness of features. However, the encoding of relatively impoverished written recalled items will create greater relative interference for the impoverished visual items than the richly encoded auditory items, leading to improved recall of auditory over visual items on later recalls. We finally assume that participants might rehearse in a cumulative forward-ordered manner with all lists, but they may be able to rehearse longer sequences of early lists items with visual silent lists than with either auditory or read aloud lists.

In summary, we have reported a systematic exploration of the modality effects across a wide range of list lengths in both IFR and ISR, contrasting visual silent presentation with both auditory (Experiment 1) and read aloud (Experiment 2) presentation. We have shown that the magnitude and extent of modality effects are similar across tasks when the list length is controlled, and we have also shown inverse modality effects in both tasks in early mid list positions for medium to long lists. We believe these findings encourage attempts to provide a unified account of both IFR and ISR. We believe that in both tasks, modality effects arise through the greater resilience of auditory items to output interference. Our data provide four findings that will constrain the development of such a theory, and additionally provide a rich data set that could be used to model the development of the serial position curve with each successively presented list item.

ARTICLE 2: Retuning of Lexical-Semantic Representations: Repetition and Spacing Effects in Word-Meaning Priming

METHODS

Thirty-three native British English speakers participated in the current experiment. However, only the data from 30 participants (23 females; mean age 24.8, range 18 – 401 ) were analysed: one participant was excluded for exceeding age requirements and two participants were excluded because of a software error, which prevented task completion. All participants reported that they had no language, hearing or vision impairments (other than corrected-to-normal vision) and had lived in the U.K. for the majority of their lives, speaking English as their first language from birth. Participants were recruited via the University College London online recruitment system or advertisements on the university campus and paid the standard rate at the time of £6/hour2 .

Sixty ambiguous words (e.g., bark, cabinet) were selected from a pretested set that had assessed dominance using a standard word association test (Warren, Vitello, Devlin & Rodd, in preparation; see the Appendix for ambiguous word list). These words had a dominance rating of 12– 42% for the subordinate meaning (mean of 25%). In all cases the primed subordinate meaning had the same pronunciation and spelling as the dominant meaning, although in some cases there was an additional meaning with a different spelling (e.g., ‘break/brake’). Polysemous words were also included as long as the related meanings were judged by the author as sufficiently distinct that they could be distinguished on the basis of word association responses (e.g., typical associates related to the two related meanings of ‘wave,’ disturbance in water or hand gesture, were deemed sufficiently distinct, whereas those to the two meanings of ‘passage,’ corridor/tunnel or journey over time/distance, were not. Thirty-eight words were classed as polysemous; Parks, Ray, & Bland, 1998).

For the subordinate prime task, a total of 60 short paragraphs (mean length of 70 words) were composed in the style of a media or literature excerpt (see supplementary materials for paragraphs). Each paragraph contained at least one of the 60 ambiguous words, disambiguated towards the subordinate meaning3 . For the three repetition condition, the ambiguous word was used in the paragraph three times and was therefore massed in presentation (i.e., the three repetitions appeared in quick succession, within the same paragraph). The first presentation of the word always occurred in the first sentence, with the second and third repetitions distributed throughout the remainder of the paragraph, e.g.,‘The cabinet concluded that a referendum would be unnecessary, since the time it would use might only worsen the financial situation. The cabinet had been in talks for several weeks about a plethora of problems, but had only discussed the idea of a referendum over the last few days. Their decision was not a popular one, since previous cabinets held many referenda, which had proven popular with the public.’

For the one repetition condition, the paragraphs were identical to the three repetition condition except that the second and third repetitions were replaced with a substitute word of a similar meaning. This was done to remove the instance of the ambiguous word itself without altering the global meaning or length of the paragraph. For example, the one repetition version of the passage above was created by replacing ‘cabinet’/‘cabinets’ in the second and third sentence with ‘politicians.’ To fully control the number of repetitions, the ambiguous words did not appear anywhere in the experiment except for their respective priming paragraphs and in the test task. The paragraphs were spoken by a British English speaker (Jennifer M. Rodd) and were digitally recorded in a sound-proof booth. For each paragraph, we created a written summary sentence (mean length 8.8 words), and participants rated how well this sentence summarised the paragraph (to encourage close attention to the paragraph; see Procedure). The summary for a given item was the same for both the one and three subordinate prime conditions. All summaries were designed to be a similarly reasonable level of quality (as quality-judgment/relatedness was the task for the participants, as explained in the Procedure)

DISCUSSION

Finally, in contrast to these two views, which both assume that it is the timing of the events that drives the observed spacing effect, we must consider an alternative view that this effect is instead driven by differences in contextual variation between massed and spaced exposures. This account proposes that spacing benefits can be explained by an encoding variability mechanism (Maddox, 2016). According to Mensink and Raaijmakers (1989) and Raaijmakers (2003), the general context surrounding a stimulus naturally fluctuates over time and this context is encoded with each presentation of a stimulus. As the temporal spacing of repetitions gets longer, the natural context is more likely to vary and that variation between stimulus encodings increases the likelihood/ magnitude of learning from that stimulus. Hence, this account would suggest that the spacing benefit arises due to the increase in different encoded contexts for the spaced word-meaning exposures, which would subsequently make the meaning more available. This model is akin to the concept of contextual diversity (Adelman, Brown, & Quesada, 2006; van Heuven, Mandera, Keuleers, & Brysbaert, 2014), which has been shown to affect word processing (lexical decision performance is better explained by contextual diversity across word occurrences than by just the frequency of occurrence). Similarly, the “One Sense per Discourse” principle (e.g., Gale et al., 1992) is based on the finding that an ambiguous word encountered multiple times within a discourse is highly likely to be used in the same meaning across those encounters, and suggests that an interlocutor would treat one subordinate repetition and three subordinate repetitions within the same discourse/paragraph as equivalents because they both provide one overall piece of evidence about one meaning (as opposed to multiple separate/spaced pieces of evidence of that one meaning).

However, we believe that this encoding variability/contextual diversity/“One Sense per Discourse” type of account is less likely to provide an explanation for the current data. Although this account can explain the observed boost for spaced presentations compared to massed presentations, it cannot explain why three massed repetitions did not boost priming compared to one repetition, given that in Experiments 2 and 3 its two additional repetitions were presented in three separate sentences that did not link together into a coherent discourse. Even in the massed condition, these three sentences proRETUNING OF LEXICAL-SEMANTIC REPRESENTATIONS 17 vided different contextual information and were distinctly presented in separate pieces of discourse (each sentence was followed by the judgment of relatedness of a probe word, and the sentences were unrelated) so this should provide enough contextual variation to see an increase in priming (compared with one repetition) even for the massed condition and even though the overall situational context did not vary a great deal. Yet, the massed condition provided no additional priming compared to one repetition, despite its two additional and distinct sentences/discourses of varying contextual information. While contextual variation accounts consider the general surrounding context rather than context within the sentence, it seems unlikely that additional sentential context would not boost priming if context were such an integral factor in priming. This makes the contextual variation account an unlikely explanation for the present findings. Clearly, it seems that there are several possible mechanisms underlying the spacing benefit but, as aforementioned, this requires further research to disentangle.

Importantly, the observed lack of benefit for multiple massed repetitions is likely to be advantageous from a communication point of view, as these instances are not always representative of the broader word usage. For instance, a conversation with a tree surgeon might involve the tree meaning of ‘bark’ multiple times in a short passage/ time-frame of perhaps minutes. If meaning preferences updated cumulatively with each of these repetitions, then this conversation alone would have a disproportionately large effect on meaning preferences for ‘bark’ compared with hearing the same number of ‘tree bark’ repetitions over a longer time-frame of perhaps days or weeks. In this case, the overly sensitive change in meaning preferences would be inefficient. In contrast, if additional word-meaning repetitions only alter representations when sufficiently spaced, lexical-semantic representations might still be somewhat sensitive to the listener’s immediate environment but would primarily reflect the listener’s long-term, temporally distributed (spaced) experience with word usage, which are more likely to accurately predict how these words are used in the future. Under this account, exposure to multiple instances of a word used with its low-frequency meaning would produce a smaller biasing effect on its lexical-semantic representation, and therefore this representation would more likely generalise to future encounters.

Adults’ lexical-semantic representations are updated dynamically in response to ongoing experience to reflect the most likely meaning of words. The present studies investigated the changes that occur as a consequence of exposure to the meanings of an ambiguous word. The results replicate the word-meaning priming effect and go further in showing that multiple subordinate repetitions provided an additional boost to priming compared with one repetition when these encounters were spaced, although this boost was eliminated when multiple repetitions were massed, at least in a word association test. Moreover, one repetition of the dominant meaning reduced, but did not eliminate, the effect of prior subordinate meaning priming. These results indicate that the experience-based changes to lexical-semantic representations are not solely based on the most recent encounter with a word meaning, nor does the effect occur with the same magnitude across repeated encounters. Rather, word-meaning interpretation appears to reflect the accumulation of recent experiences with wordmeanings, where the temporal spacing of multiple encounters is key to producing additional learning effects. This seems to provide a balance among the influences of word usage patterns across a range of timescales, such that listeners can dynamically retune and update their lexical-semantic representations in response to recent experience while maintaining their longer-term knowledge of word-meaning dominance.

ARTICLE 3: Threat of Shock and Aversive Inhibition: Induced Anxiety Modulates Pavlovian-Instrumental Interactions

METHODS

Sixty-two healthy participants (39 females; age range 18–57; Mage 27.16, SD 7.83) were recruited from the University College London (UCL) Institute of Cognitive Neuroscience Subject Database. Sample size was determined by an a priori power analysis in G Power (Faul, Erdfelder, Lang, & Buchner, 2007). The power analysis was based on the main finding from the reinforced go/no-go task showing that participants are significantly slower to respond in the punished conditions relative to the rewarded conditions, with a Cohen’s dz (within-subjects) effect size of 0.487 (Crockett et al., 2009). Detecting an effect size of this magnitude using a paired t test requires 57 participants at the 0.05 alpha level (two-tailed) with 95% power. The present study recruited 62 participants to allow for a small number of unusable data sets.

Due to a recording fault during the sustained attention to response task (SART), one female participant was excluded, resulting in 61 participants in the SART. Participants reported no history of psychiatric, neurological or substance use disorders and no pacemaker implantation. Participants provided written informed consent and were reimbursed £7.50/hr for participation. To incentivize performance, participants were also informed that they could receive additional financial compensation based on task performance. The study obtained ethical approval from the UCL Research Ethics Committee (Project ID Number: 1764/001) and was conducted in accordance with the Declaration of Helsinki. Data and materials for the tasks are freely available for download (https://figshare.com/articles/SART\_script/3443093 and https://dx .doi.org/10.6084/m9.figshare.c.3291299.v1).

The ToS procedure is identical to Mkrtchian, Aylward, Dayan, Roiser, and Robinson (2017). Anxiety was induced with the ToS paradigm where unpredictable electric shocks were delivered with two electrodes attached to the nondominant wrist using a Digitimer DS5 Constant Current Stimulator (Digitimer Ltd, Welwyn Garden City, U.K.). A highly unpleasant but not painful (Schmitz & Grillon, 2012) subjective shock level was established using a shock work-up procedure prior to testing. No more than five (to avoid habituation) shocks with a gradually increasing shock level were administered. Participants rated each shock on a scale from 1 (barely felt it) to 5 (unbearable) to reach a shock level of 4. The reinforced go/no-go task was programmed in Psychtoolbox (http:// psychtoolbox.org) and the SART in Cogent (Wellcome Trust Centre for Neuroimaging and Institute of Cognitive Neuroscience, UCL, London, U.K.) using MATLAB (Release 2014a, The MathWorks, Inc., Natick, MA, United States).

Both tasks were presented on a laptop and administered under alternating safe and threat blocks. During the safe block, the background color was blue and the block was preceded by a 4000ms message stating, “You are now safe from shock.” During the threat block, the background color was red and the message, “Warning! You are now at risk of shock” was presented for 4,000 ms at the beginning. Participants were told that they might receive a shock only during the threat condition but that the shocks were not dependent on their performance. At the end of each experimental task, participants retrospectively rated how anxious, stressed and afraid they felt during the safe and threat conditions on a scale from 1 (not at all) to 10 (very much so). Numerous previous studies have implemented this questionnaire to assess effectiveness of the threat condition (Robinson, Vytal, et al., 2013). The reinforced go/no-go task and SART were administered together with a third task (the third task was part of a larger study including a patient group and are published separately: Mkrtchian et al., 2017). All experimental tasks were administered in a counterbalanced order across participants.

DISCUSSION

As a potential caveat, it should be noted that it is possible that ToS influences motivational behavior by impairing instrumental control rather than by promoting aversive Pavlovian control. However, we believe that this is unlikely for a number of reasons. First, the present results are consistent with the previously discussed studies indicating that anxiety affects Pavlovian mechanisms (Duits et al., 2015; Lissek et al., 2005; Robinson, Overstreet, et al., 2013). Strikingly, a recent study demonstrated that avoidance behavior in mood and anxiety disorders is driven by aversive Pavlovian biases as tested in a similar Pavlovian-instrumental task (Mkrtchian et al., 2017). Second, in contrast to instrumental behaviors, aversive Pavlovian biases are evolutionary adaptive and rapid mechanisms evolved to avoid potential harm and increase survival (Dickinson & Balleine, 2002). They may therefore have a particularly important role in adaptive anxiety, which itself is likely an evolutionary adaptive mechanism. Thus from an evolutionary standpoint, it would make sense for anxiety, a state that accompanies potentially threatening situations, to potentiate a mechanism programmed to avoid harm, as opposed to disengaging the instrumental system. If anxiety instead impaired the instrumental system, it would likely lead to increased exposure of harmful situations because, as highlighted above, the instrumental and Pavlovian systems are generally aligned to facilitate optimal behaviors in nature (Rangel et al., 2008). Based on these findings, we propose that the most plausible explanation for our results is that anxiety influences motivational behavior via modulation of aversive Pavlovian processes. However, we acknowledge that these results do not provide definitive evidence that the increased inhibition under threat is driven by aversive Pavlovian biases. In light of this, interpretations are tentative and future studies are warranted to confirm the present results.

As a further caveat, it should be noted that the no-go conditions were not significantly different from each other. We might expect performance to be significantly slower in the NGA condition compared with the NGW condition as the Pavlovian and instrumental controllers both promote inhibitory responses (slowing of responses) in the NGA condition while they compete in the NGW condition. However, the response bias, HR, and FAR scores all indicate that the reinforcement schedules were in fact successful in generating an action bias. This lack of difference might be attributed to RTs in the no-go conditions being at floor levels. Indeed, there was no significant difference between the GA condition under threat compared with the NGA condition under safe and threat. This is perhaps surprising as we would expect the NGA condition to produce the slowest responses as both Pavlovian and instrumental responses promote inhibition (while the slowing of responses in the GA condition under threat is only driven by the Pavlovian no-go bias). It thus seems that the slowest participants can perform on this task is capped at the level of the GA condition under threat. It is therefore not entirely clear whether the effect of ToS on Pavlovian-instrumental interactions is driven simply by an aversive Pavlovian bias, or if it is specific to when Pavlovian bias conflicts with instrumental processes in an aversive context. Another possibility might be that the conflict between Pavlovian and instrumental controllers in the NGW condition promote cautiousness and slowing, rendering it similarly slow as the NGA condition. A final possibility is that this specific task is simply insensitive to appetitive Pavlovian-instrumental conflict. However, we believe that if ToS affected appetitive conflict as well, it would still have been revealed by the present task. Specifically, if ToS induced a general slowing of responses, regardless of an appetitive or aversive context, we would also expect to see slowing of responses under threat in the GW condition. This is not supported by the data. If, on the other hand, ToS induced a greater reliance on Pavlovian appetitive biases or impaired instrumental control in the appetitive condition, we would expect faster responses under threat in the NGW condition. Faster response times would be possible, as evidenced by faster response times on other conditions. However, this effect of threat was not observed. Moreover, the present results are in line with previous studies demonstrating that ToS only affects aversive but not appetitive conditions (for a review see Robinson, Vytal, et al., 2013). In summary, our view is that the most parsimonious explanation for the results that were observed is that threat impacts aversive Pavlovian responding. However, future studies might plausibly explore the impact of stimulus presentation duration on RTs to attempt to tease these effects apart.

Finally, it should be noted that our main analysis slightly deviated from the original study (Crockett et al., 2009) such that the first practice block was chosen as the response latency baseline as opposed to the first neutral block. Prior to analysis, we reasoned that this would be the most appropriate measure of baseline RTs in our study. Another possible baseline could have been the first neutral block during the safe condition, in accordance with Crockett et al. (2009). However, due to the counterbalanced threat manipulation in our study, only half of the participants experienced the first neutral block under the safe condition. Power to detect an effect would therefore be reduced to 50% with this baseline, and perhaps more importantly, the threat manipulation would no longer be counterbalanced, rendering it an inappropriate baseline choice. Future studies should include a neutral block before the threat manipulation to assess baseline RTs, so as to replicate the analyses of Crockett et al. (2009) precisely.

In conclusion, this is the first study to suggest that ToS selectively promotes punishment-induced inhibition in motivational behavior. Importantly, the present study provides a potential mechanistic understanding of this: Adaptive anxiety promotes avoidant behavior in potentially harmful situations by increasing reliance on aversive Pavlovian processes.

Article 4: Exploring the understanding and application of motivational interviewing in Applied Sport Psychology

Methods

This study applied qualitative methods to capture an emic account (Jary & Jary, 2000) of practitioners’ professional practice and understanding and use of MI. Data were collected in the form of one-to-one semistructured interviews. This type of informal interview permits the interviewer to use a conversational style and ask spontaneous questions while maintaining focus on a specific topic (Patton, 2002).

Participants were Chartered sport and exercise psychologists, Registered with the British Psychological Society (BPS) and the Health and Care Professions Council (HCPC). A purposeful sample (Patton, 2002) of 18 UK-based sport and exercise psychologists was contacted via e-mail (available to the public through the BPS website) to participate voluntarily in this study. To qualify for inclusion, participants were also qualified to supervise sport and exercise psychologists in training, and currently working in an applied setting with athletes. Of the 18 participants contacted, 11 (8 males, 3 females) aged between 37 and 65 years (44.5 ± 8.3 years) agreed to take part in the study. Participants had between 10 and 35 years (19.6 ± 7.78 years) of experience, and all had worked with professional, international or Olympic athletes. Participants had worked with athletes from team and individual sports, such as rugby, football, equestrian, judo and shooting. Participants had also worked with youth and adult athletes, and able-bodied and disabled athletes.

Two pilot interviews were conducted; one with a BPS chartered sport and exercise psychologist, and one with a BPS sport and exercise psychologist in training. The purpose of this was to test the interview guide, check clarity, and practice interviewer skills. Each member of the research team contributed to the final interview guide (Appendix). Questions in the interview guide focused on key themes concerning professional practice and applied techniques, therapeutic alliance, and awareness and use of MI. Questions included, “When you first start working with a client, how do you begin to build a relationship/ alliance with them?” and “Which specific communication skills do you employ to underpin your work?” Interviews were then conducted with participants, using the finalised interview guide.

Participants were sent information sheets before their interviews, which stated the aim of the study and gave a brief description of the interview procedure. A consent form highlighted participant anonymity and detailed their right to withdraw. Voluntary, written, informed consent was given by all participants. Ethics approval was provided by the governing institution (HWB-S&E-38, Sheffield Hallam University). Participants were afforded an opportunity to ask questions before commencement of their interview, and demographic information was collected at this point. All interviews were conducted by the principal researcher, who has previously conducted interview-based research, is a sport and exercise psychologist in training with the BPS, and a member of the Motivational Interviewing Network of Trainers (MINT). Ten interviews took place using video conferencing software, and one was face-to-face. Video software was used to accommodate participants since they were spread across the UK. Interviews lasted approximately 60 min, were audio recorded and transcribed verbatim.

Discussion

Participants in the current study outlined a range of approaches which underpin their applied work, and several of these can be seen to fall within the frameworks and models proposed by Hill (2001) and Poczwardowski and colleagues (2004). What remains unclear is how a practitioner should integrate different approaches in a complementary, considered, faithful manner. It seems that sport psychology could perhaps learn from other areas of psychology about how to truly integrate different approaches: “First, there needs to be in-depth learning of the substance of two or more theoretical traditions, and second, there must be an orienting framework for theoretical and/or technical assimilation and accommodation” (Boswell, 2016, p.5). Consideration must also be given to the philosophical underpinnings of MI, and how these may or may not be congruent with different action-orientated, directive, or instruction-based interventions which may be common in applied sport psychology. Nevertheless, it has been suggested that relational techniques from the MI approach can be used alongside content-based interventions, irrespective of theoretical stance (Hardcastle et al., 2017; Hardcastle, 2016).

This study investigated the level of understanding and use of MI with applied sport psychologists who are not experts in the MI approach, and identified some explicit understanding and use, and much implicit use of MI. It is now pertinent for future research to investigate this area with practitioners who are experts in MI and are working in sport. This will begin the process of identifying best practice around applying MI in sport as part of an integrated approach, and as an intervention in its own right, which might then inform the training curricula of students and neophyte practitioners in this discipline. Participants in the current study cited a lack of research on this approach in this domain, and a lack of sport-specific examples for practitioners, as barriers to learning and using MI in sport psychology. As such, it will be important for future research to fill these knowledge gaps. Based on existing literature highlighting the important role of relationships between practitioner and athletes (e.g., Sharp et al., 2015), one avenue for future research could be in the development of a sport-specific measure of the therapeutic alliance, as an ongoing assessment of the strength of the consultancy relationship from the perspective of the client. Another avenue worthy of exploration would be adaptions to MI for working with different sporting populations, including groups (teams) and adolescents. Finally, an exploration of integrating MI with different action-orientated approaches in sport psychology (e.g., rational emotive behavior therapy (Wood, Barker, & Turner, 2017); solution focused therapy (Hoigaard & Johansen, 2004)) may further enhance professional practice.

Although this study has generated novel information about the role of MI in applied sport psychology, there are some limitations which must be acknowledged. The practitioners sampled are well established in the discipline and are currently working at the elite level. Therefore, their experiences are perhaps not representative of those who are just beginning their careers, regarding the level of athlete that they work with, and the nature of the work itself. At the elite level, practitioners are perhaps less likely to encounter disengagement and resistance, for example. When neophytes are beginning the training process, they may experience increased levels of ambivalence or disengagement, given that they are unlikely to be working with elite athletes. In addition, the participants sampled in the current study are working primarily with athletes individually. Again this is perhaps not representative of the neophyte’s experience, where they are potentially delivering workshops and seminars to teams or groups of athletes and coaches. Both of these examples support the need to explore MI in sport psychology when working with resistant athletes and for adaptations for working with teams.

This study has begun the process of exploring the application of MI in sport psychology, and identified the need to clarify the system of integrating different approaches. It is proposed here that this counseling approach can underpin the delivery of sport psychology’s dominant action-orientated interventions, and enhance the practitioner-athlete relationship. Discrepancy between responses related to explicit and implicit use of MI indicates that the MI approach has more to offer applied sport psychology—to the training curricula for students of the discipline, and ongoing professional development of neophyte practitioners and established practitioners alike.

Article 5: Reprioritizing life: A conceptual model of how women with type 1 diabetes deal with main concerns in early motherhood.

Methods

Grounded theory methodology aims to explain a general pattern of behaviour (Glaser & Strauss, 1967). In the present study a constructivist, grounded theory was chosen according to Charmaz (2014), who stresses that the “researcher is a part of what they study, not separate from it” (Charmaz, 2014, p. 320).

The women were recruited retrospectively from participants in a randomized controlled trial (RCT) evaluating web-based support carried out in Sweden for women with T1DM during pregnancy and up to 6 months after childbirth (MODIAB-Web). Women from both the intervention and control groups at three of the six included hospitals were asked to participate. The health care in the respective hospitals differed somewhat. In pregnancy all women with T1DM had frequent follow-ups at a hospital-based special antenatal care unit, which ended with a final followup around 6 weeks after birth. Parental leave in Sweden is financed by the Swedish Social Insurance Agency and the employer, and parents can use 480 days of paid parental leave for each child. Most of these days can be divided between the parents. The majority of mothers take full-time leave during the first months after birth (the Swedish Social Insurance Agency, 2010).

Based on a purposeful sampling procedure, eligible women were contacted by phone after data collection for the MODIAB-Web study was completed, that is, at least 6 months after childbirth, and asked about their willingness to participate in the present study. Of 18 women contacted, 4 declined and 14 agreed to participate. Interviews were conducted between 2014 and 2016. The participants had a median diabetes duration of 24 years (range 5–30). Their median age was 33 years (range 25–40); eight of them were primiparous and six were multiparous. One woman was single, and the others were living with the father of the child. Most women had a university degree (n = 8), five had completed secondary school, and one primary school.

The interviews were conducted 7–17 months after childbirth by three different researchers at a place chosen by the women. Five interviews were conducted by telephone due to distance. Each interview started with open-ended questions such as “Could you please tell me how you would describe your situation as a new mother with type 1 diabetes and how you handle your situation as a new mother with type 1 diabetes?” In accordance with the methodology, follow-up questions were posed, based on emergent data from previously analysed interviews (Corbin & Strauss, 2008). The interviews lasted 25–60 min and were audiotaped and transcribed verbatim.

Discussion

In line with what was described in our study regarding the benefits of having technical tools that support daily life, it seems relevant to advocate for the availability of getting CGM advice in the early postpartum period. This would be to assist the mother’s adjustment to rapid changes in blood glucose levels, and especially to avoid hypoglycaemic episodes, as they interfere with taking care of the baby, including the child’s security. The women’s heightened awareness of the need for control, together with a reassuring effect of early alarms in case of a trend towards hypoglycaemia, might support these women in taking command of their diabetes. Fallon and Dunne (2015) claim that fundamental needs for women with type 1 diabetes are those related to safety and security. Since professional support is not available 24 h a day, particularly during early motherhood, technical devices can assist in continuously monitoring the unfamiliar and unpredictable blood glucose levels. This could be time and energy saving and might decrease the burden of daily self-management, potentially leading to better wellbeing and less exhaustion for these women. This is in line with what was found in a previous study by our research group (Berg & Sparud-Lundin, 2012; Berg et al., 2012).

Beyond technical devices for diabetes management, healthcare providers and peers could play a crucial role in supporting these women during early motherhood. The form of antenatal care provider has been found to influence the intention to breastfeed in women with diabetes (Finkelstein et al., 2013). For women in our study the frequent contacts with the antenatal care providers during pregnancy were abruptly interrupted when the child was born. Other healthcare professionals, either during the early postpartum care or after discharge, did not replace their supportive role. During a period of experiencing a more unfamiliar diabetes than ever before, and with reformulated incentives for taking care of themselves simultaneously with caring for the baby, most of the women in our study felt left with the responsibility. As the healthcare system did not support them sufficiently during early motherhood, they searched for support from other women in similar conditions. This is in line with the findings of Edwards et al. (2016), who made an extensive qualitative exploration of 200 electronic interactions between women with type 1 diabetes, from planning pregnancy, throughout pregnancy, and into early motherhood. The communication was retrieved from a free Internet-based counselling service and psychosocial support provided by a non-profit organization mainly for people with diabetes. Diabetes-specific distress was most frequent during “contemplation”, for example, when considering pregnancy, followed closely by the phase of motherhood. Depressed mood peaked during motherhood, and partners were not always able to understand their experiences. The authors conclude that contacts with other women who have experiences of pregnancy and motherhood seem to offer assurance not provided by their healthcare providers (Edwards et al., 2016). Although healthcare providers can assist in advising on how to make adjustments in insulin doses and so forth in order to balance the juggling of blood glucose, peers with diabetes are more likely to help prioritize the dual role in early motherhood.

Although the findings in this study resonate with other research, and by that demonstrate transferability, some limitations need to be acknowledged. First, the question of selection bias is always present in research studies. However, the effort to achieve a INTERNATIONAL JOURNAL OF QUALITATIVE STUDIES ON HEALTH AND WELL-BEING 7 varied sample of women with type 1 diabetes with respect to experiences both of being a first-time mother and of having given birth earlier increases external validity. Second, socioeconomic differences regarding educational levels, social welfare systems (for paid parental leave) and healthcare systems, as well as varying sociocultural attitudes towards breastfeeding, can have an impact on the transferability of the findings to other societies.

Having diabetes and being in the early period after giving birth to a child is demanding and challenging. The healthcare system needs to support these women, especially first-time mothers. After the extraordinary health care provided during pregnancy, it would be highly relevant and important to at least phase out the frequent support more gradually after the childbirth, not least because of the new challenges faced in relation to diabetes management in early motherhood. Therefore, we propose that a woman with type 1 diabetes should have planned and frequent contacts with her diabetes nurse directly after childbirth, preferably arranged beforehand. To secure the diabetes management support, telephone follow-up once or twice a week could be relevant during this extra-demanding period, as well as accessibility to technical support for facilitating daily self-management, if wanted. Moreover, providing these women with alternative sources for health information and peer support beyond the antenatal and diabetes care has the potential to improve their life situation during motherhood. This needs to be further investigated in upcoming studies.

Article 6: Classroom interaction in effective and ineffective schools: Preliminary results from phase III of the Louisiana school effectiveness study

Methods

Twelve school systems had comprised the LSES-II population. One additional large system was added to the sampling pool for LSES-III. Nine pairs of schools were chosen using the following procedure:

Within individual school systems, third grade school means on the Total Reading section of the state Basic Skills Test (BST)1 were computed. The BST is administered in late March of each year. Mean scores were developed for both the '82-'83 and '83- '84 school years.

Within each large school system, and among contiguous rural systems, regression models were developed in which mother's education, father's profession, and student body racial composition were independent variables predicting mean BST reading scores. A total of seven separate models were used.

A school was considered for inclusion in LSES-II if a) the school scored above (or below) achievement prediction both years, b) the school scored substantially above (below) prediction at least one year, and c) a matching opposite directional outlier of similar racial composition was identified within that system (or in a contiguous system in the rural models).

Discussion

Third, at Adams, and at almost all positive outlier schools in LSES-III, there was a prominent display of the names of academic honor roll students in a heavily traveled hall near the principal's office. Academic excellence was the single most important goal of the school. Of central interest in LSES-III, the school's commitment to academics had been translated into in-class action. The rate of interactive instructing at Adams nearly doubled that at Fillmore. Similarly, time spent in organizing and off-task activities was a third lower at Adams.

If a rational, data based school improvement literature is to develop, it will require information from both the school-effectiveness and teacher-effectiveness literatures. Good and Brophy (1986) have argued for research which nests classroom interaction studies within larger school effectiveness studies. Such research can provide a bridge between the school effectiveness and more devel­ oped teacher effectiveness literatures. LSES-III is one such study. We are just beginning the analysis of data from this phase, yet the first preliminary analyses presented here indicate that the method offers promise. If further analyses confirm our findings in the 16 school database, and if other studies replicate.

LSES-III findings, then connections will have been built between the "process" of the two fields, and substantial progress will have been made toward the development of a more unified model of effective schooling.

Given that practice cannot wait on theory development, practical issues should be addressed. To date, the quasi-experimental teacher effectiveness literature is much more developed than similar efforts in the school effectiveness field. The preliminary findings of LSES-III suggest that school "culture" and other school level variables are translated in effective schools into specific, measurable teacher behaviors. In several studies (e.g., Anderson, Evertson, and Brophy, 1979; Good and Grouws, 1979; Stallings, 1980) these teacher behaviors have proven alterable through extensive, specific, behaviorally based workshops series. Future school improvement studies might find added strength in in-depth efforts to change patterns of classroom interaction.

Article 7: Exploring the nature of counterfactual thinking and their perceived consequences in an elite sporting context: An interpretative phenomenological analysis

Methods

Seven athletes (4 male, 3 female) were recruited to take part in the study. They represent a range of different sports (Rifle Shooting, 3; Athletics, 1; Football, 1; Fencing, 1; Swimming, 1) and have all competed at professional, national or international level (including Woman’s Premier South, World Championships, World Cups, European Championships, British Championships, Commonwealth games, and Paralympics games). In accordance with Swann and colleagues (2015), participants therefore represented competitive-elite and successfulelite athlete populations. Participants were aged 20–68 years (M = 33.29, SD= 16.40) and were selected from a range of sports to provide and explore different contexts of counterfactuals. To provide free recollections of counterfactuals, participants were also required to be involved in regular training and have recently competed.

A qualitative interview methodology was u to explore the nature of counterfactuals and their perceived consequences in elite athletes. Semistructured interviews were conducted to gather participant data underpinned by a phenomenological perspective, which aims to understand the athlete’s personal lived experience of a phenomenon (Smith & Osborn, 2003). In relation to the phenomenological approach, an Interpretative Phenomenological Analysis (IPA; Smith,1996) was used to analyze the data obtained as it ‘‘offers psychologists the opportunity to learn from the insights of the experts—research participants themselves’’ (Reid, Flowers, & Larkin, 2005, p. 20).

The semistructured interview schedule was constructed to suit the use of IPA and follow the guidelines set by Smith (1995) and Smith and Osborn (2003). The interviews were designed to allow the interviewer to frame questions in a broad and open manner and to prompt for more detail if needed. Using suggestions by Smith and Osborn (2003), the first section of the interview was designed to build rapport with participants, through the discussion of their history in their particular sport, their season so far and then a discussion of a recent competitive event to explore the use of counterfactuals and their perceived consequences.

Participants were asked to recall their personal experience of counterfactuals and their perceived consequences around a recent event. A general open question ‘Tell me about your personal experience of a recent positive/ negative event that you thought could have turned out differently. . . ’ was used to get a detailed outline of the event and the counterfactuals experienced. From this, the interviewer used probing questions to get more details on the counterfactual’s type (e.g., upward or downward), content, direction (e.g., self or others), structure (e.g., additive or subtractive), controllability and their perceived consequences (e.g., thoughts, behaviors and emotions). These probing questions were designed to be a ‘gentle nudge from the interviewer’ (Smith & Osborn, 2003) to reduce researcher bias and avoid leading the participant to a predetermined conclusion. As most of the initial counterfactuals were of an upward nature, the process was repeated to explore downward counterfactuals during the specified events. A draft of the interview schedule was piloted in an interview carried out with a novice squash player. This informed the final draft of the interview schedule.

Discussion

It is acknowledged that the small sample size limits its generalizability. The study aimed to gather similar numbers of both male and female athletes to ensure both populations were represented. However, gaining an equal number of participants depending on type of sport (e.g., individual vs team, closed vs open skills) was not a priority. In this study, one athlete participated in a team sport and there was evidence that counterfactuals would be influenced by contextual factors such as being part of a group. For example, a team athlete might experience more counterfactuals directed at others’ behaviors that influence outcome. This might be seen as less controllable and might influence the consequences associated with the counterfactuals experienced. Future research might aim to explore these differences and the possible gender differences in the generation and experience of counterfactuals and their perceived consequences regarding elite athletes.

In using semistructured interviews to explore athletes’ counterfactuals, it is plausible that memory decay and poor reconstructive processes may have influenced participants’ responses (Brewer, Van Raalte, Linder, & Van Raalte 1991; Smith, Leffingwell, & Ptacek, 1999). Reporting on significant past events or capturing in the moment counterfactual thoughts, think out load protocols could be applied in future (Nicholls & Polman, 2008). However, both think out loud and semistructured interview protocols are researcher prompted. Alternative methods such as archival methods might be used to capture self-generated counterfactuals.

Despite the limitations, the use of currently competing elite athletes provided ecologically validity to the representation of counterfactuals experienced and their perceived consequences. Findings from this study could be of value for those in the applied settings working with both elite athletes and less experienced athletes. Upward counterfactuals present themselves when performance does not reach a certain level set by expectations or goals. It is therefore important to monitor each athlete’s expectations and ensure the athlete’s goals are flexible to alleviate negative emotional consequences that could be debilitative to performance or motivation. This may be shaped by the cultural environment and their goals. Goals around process and development may lead to an assimilation effect where motivation and performance can be enhanced. In relation to the REM (Markman & McMullen, 2003), upward counterfactual thoughts would be best used in a reflective process following an event to inform goals and intention for future practice and competitive behavior change. These could also be useful for significant others (e.g., coaches, physiotherapist, support staff) to inform how they might deal with issues brought up by the athlete that they might influence. For example, if there is conflict between two athletes then a coach might use each athlete’s counterfactuals using reflective practice to come up with a management strategy to overcome the issue. In addition, counterfactuals could be used to gain perspective on these goals and protect an athlete’s self-esteem following failure (McCrea, 2008). Beyond the scope of elite athletes, individuals who participate in performance related activities (e.g., business, sport & exercise practitioners, health services) would benefit from lessons learned from elite athletes to understand and suitably use counterfactuals to facilitate cognitive, emotional and behavioral change to enhance their practice.

This study taps into the experiences elite athletes have of counterfactuals. It also provides an insight into how elite athletes cope with the negatives effects of counterfactuals as well as use the positive effects of counterfactuals to improve and sustain high performance. Future research on elite athletes’ counterfactual thoughts using experimental and longitudinal studies would be beneficial to investigate the antecedents and consequences of counterfactual thinking on training and performance. The use of an elite population could be a useful source for understanding high performance athletes and how they experience thoughts, emotions and behaviors. By understanding how elite athletes generate, experience and reflect on counterfactuals, it is hoped other athletes can use counterfactuals to identify causal inferences and deploy accompanying changes to enhance both performance and motivation to succeed making sport more fulfilling and enjoyable.

Article 8: A positive psychology intervention in a hindu community: The pilot study of the hero lab curriculum

Methods

The pilot program was conducted in a migratory slum in Worli, Mumbai. A migratory slum is defined as an area where families live in tents on the street, with polythene sheets as roofs, open drains as toilets, and no access to electricity or sanitation (World Bank: Sanitation). The residents of the Worli community in Mumbai are all Hindu migrants from the Surendranagar and Rajkot villages of the Indian state of Gujarat. The average income of each family in the Worli slum is between 6000 and 10,000 rupees a month, with about six people per household. This equates to about $90–$150 a month, or about 50–83 cents a day per individual, placing most of residents under the extreme poverty line of less than $1.25 a day (World Bank: Poverty). While the male to female ratio is roughly even, women are the primary earners in the household. All children were allowed to participate in the initiative; however, an Adverse Childhood Experiences survey was conducted by all participants before formally enrolling in the curriculum. The ACE survey can be found online (Centers for Disease Control and Prevention 2016). This initiative was approved by the ‘‘The Hero Lab’’, a non-profit organization. Written informed consent was obtained from each child’s parents in accordance with the Helsinki II Declaration (Carlson et al. 2004).

The Hero Lab’s Stage 1 curriculum is a 6-month interactive program rooted in positive psychology interventions focused on themes that promote well-being (e.g., grit, empathy, hope). Table 1 lists examples of interventions from the curriculum. The lessons lead to a student-led project, in which participants exercise their strengths and skills in a designthinking process to ideate, prototype, and launch a project in their neighborhood. Classes were held 5 days a week in Worli for 6 months on a large tarp in front of participant’s homes. The curriculum was taught by a trained community leader of the same background in regards to faith (Hindu), language, and geography (same community).

Once enrolled into the curriculum, but prior to its intervention, students were administered the eight following surveys by a Hindi-speaking team member to assess their baseline levels of well-being on specific psychological metrics: the General Happiness Scale, the Meaning in Life Questionnaire (MLQ) for Search (Search for Meaning in Life) and MLQ Presence (Presence of Meaning in Life), the Gratitude Survey, the 12-Item Grit Scale, the Toronto Empathy Questionnaire (TEQ), the Life Orientation Test (LOT-R) for measuring optimism and pessimism, and the Curiosity and Exploration Inventory (CEI-II). The surveys were administered orally due to low literacy levels and literal language translation issues. Copies of the surveys are available online and available upon request.

The primary objective was to see whether through a positive psychology curriculum, the students would be able to implement a project that shows their determination toward improving their community and its future. Secondary objectives were to see if the variables highlighted by the aforementioned surveys were impacted by the positive psychology intervention.

Discussion

Many Hindu populations, particularly in lower-income communities, attribute mental illness to karma (destiny) and choose not to seek professional help as they have accepted their condition as fate, or that nazar (the evil eye) causes cognitive dysfunction through supernatural causes (Juthani 2001; Betty 2005). Both patients and caregivers in these communities tend to seek treatments that align with their own beliefs, for example, spiritual healers, instead of visiting medical doctors (Dwyer 2003). Given India’s high rate of mental health issues coupled with its dearth of mental health providers, low-income Hindu communities stand to be even more impacted by mental health issues. However, given the significant emphasis on the community’s well-being over an individuals, this concept was utilized to link the positive psychology intervention with Hinduism: the teachers were from the community and the positive psychology interventions were taught in the community. Thus, a fundamental difference between these two perspectives (community by Hinduism and individual by positive psychology) was able to be utilized in an approach that sought to improve the well-being of the community’s youth overall.

As highlighted above, one unique approach taken by the Hero Lab intervention was to implement the initiative in front of the children’s homes, as opposed to in a school or building away from the community. This meant the curriculum was taught in the presence of family. This was crucial to the success of the curriculum because youth were learning to identify their signature strengths and build resilience, gratitude, hope, and purpose with their daily reality in the backdrop, not away from it. Students who graduated into the Stage 2 curriculum, equipped with the strengths, values and mindsets to contribute to their own happiness and their community’s happiness, are currently using design thinking to launch and lead three major projects: an English and storytelling program for local youth, a community cleanup campaign, and art classes for kids in the neighborhood to have a medium for self-expression. The success of the youth-organized capstone project and the ideas now being launched in the Stage 2 program are testaments to how teaching at-risk communities to not just learn, but to apply positive psychology, can reinforce teachings and contribute to greater social capital, neighbourhood cohesion, and deeper connections between self and community.

There are several limitations to this study. First, the skills and mindsets cultivated in the program need to be realized and applied over longer periods of time, and there is always a possibility given the volatile environments of these communities that strengths and values can be undone if they are not reinforced. However, this was taken into account by designing three stages of curricula for youth, such that once they finish one curriculum, they graduate into the next to continue building, but more importantly applying these softskills for well-being. The Stage 2 curriculum continues teaching positive psychology through design thinking and the Stage 3 curriculum focuses on building resilience in an entrepreneurial capacity by training local-level changemakers to launch their own social ventures. Second, this was a small sample size, and not a true representation of all the demographics and cultures of India. Thus, it would be useful in determining whether this curriculum can be implemented with the same success across slum communities with different types of adverse childhood experiences and diverse racial, religious, and economic makeups. To explore this, the Stage 1 curriculum is currently being taught in three other slums in Mumbai with a population ranging from 500 people to 700,000. A third limitation is understanding how this intervention translates into mental health outcomes in adulthood, which ongoing studies will explore. Fourth, it is unclear what part of the curriculum had the most impact on the participants, especially since it was implemented at the homes of the children. Regardless, the Hero Lab intervention as well as the location of the curriculum seemed to have played a significant role in improving specific elements of mental health in the participants. Finally, this was a small study (n = 50) and therefore needs a larger number of participants and greater community involvement in order to achieve substantial results, especially results that are sustained over time.

To date, positive psychology research has focused extensively on upper-middle class populations in developed economies. Though this trend is slowly shifting with non-profits and independent educators pioneering interventions in low-income schools and populations, there is a real and significant need for a more robust exploration in these settings. The intervention in Worli, Mumbai shows how positive psychology can be a low-cost, powerful tool to build the strengths, subjective values, and strong sense of meaning and purpose required to promote well-being and shield at-risk youth from depression. This study also reveals that when a positive psychology intervention is ingrained in community life, there is more buy-in from locals, and teachings can be applied directly to social impact and community upliftment. Further, long-term studies should explore how faith and positive psychology interventions correlate with reduced incidents of mental illness in low-income settings on at-risk children

Article 9: Methodological pluralism and mixed methodology to strengthen community psychology research: An example from oxford house

Methods

Articles were located through a PsycInfo search (search terms: “Oxford House;” National Institute on Drug Abuse grants “DA13231,” “DA19935,” and DA16037”; National Institute of Health, Institute on Minority Health and Health Disparities grant “#5R24MD002748”) and were cross-referenced with records maintained by XX University. Articles were included in the current study if they focused in whole or in part on Oxford Houses or their residents. We included articles from peer-reviewed journals and one book chapter that had empirical data. Magazine articles and non-peer reviewed journal articles were excluded. The aforementioned inclusion criteria resulted in a total sample size of 126 peer-reviewed articles (including the one book chapter). These articles were published between 1995 and July 2015. For the purpose of coding study design and types of data analysis, we only included articles that reported data analyses; thus, 12 theoretical or review articles were excluded from further analysis, resulting in a subsample of 114 empirical articles with data. We had hoped to find articles from different research teams, but instead, we found that all of the articles included authors who were currently or previously associated with the DePaul University team conducting the present review.

The study design coding scheme was created using study designs presented in previous research and advanced psychology research methods textbooks (e.g., Bodner, 2006; Goodwin, 2005; Montero & Leon, 2007). The research team integrated the study designs presented in these resources to create the following categories: (a) descriptive studies using systematic observation, (b) cross-sectional descriptive studies through survey research, (c) longitudinal studies through survey research, (d) experiments, between-subjects designs, (e) experiments, within-subjects designs, (f) quasi-experiments, (g) ex post facto, retrospective studies, (h) ex post facto, prospective studies, (i) measure development studies, (j) ethnographic studies, (k) case studies, (l) action research studies, (m) qualitative interviews, and (n) mixed methods studies.

In some cases, a guideline set by one resource was modified to parallel guidelines from other resources and capture the extent of the research articles surveyed. For example, Montero and Leon (2007) advise that cross-sectional and longitudinal descriptive studies are solely descriptive and should not have hypotheses; however, many Oxford House articles were descriptive in nature but still proposed hypotheses based on existing theory and research. With consultation from the third author, the first and second authors developed this coding scheme. The first author coded all of the articles, and the first and second authors coded a subsample of articles, with high levels of agreement. If a question about coding arose, a discussion between all authors took place to make a final coding decision.

For coding data analyses, every analysis employed in a research article was counted to obtain the total number of times the analysis was used across all Oxford House research studies. Additionally, the main or most important analysis was coded in every study to create a count of the number of times the analysis technique was used as the main analysis among all Oxford House research articles.

Discussion

By reflecting on the research methods that have been used in collaboration with the Oxford House organization, the present article outlines the many ways to empirically evaluate and investigate recovery residences. Until recently, research on substance abuse has largely focused on formal treatment and the genetics and neuroscience of addiction. Although studying these individual factors is important for addiction research, investigating environmental factors and how they interact with individuals is equally fundamental for recovery research. In fact, the Obama administration, through the National Drug Control Strategy (2013), has emphasized the importance of working with stakeholders to develop services that support sustained recovery, such as recovery residences and other peer support services that can be provided by individuals who themselves are in recovery. Further research on the role of housing and recovery residences in substance abuse will enable policy makers and practitioners to better understand the legitimacy and importance of recovery residences and mutually supportive recovery organizations (Jason et al., 2013).

This article has several limitations. Current or former members of the DePaul University research team conducted all of the studies included in this article, because other research teams have not yet conducted empirical evaluations of Oxford House. Although there are strengths associated with having a pluralistic research program, there are also many benefits associated with having findings replicated by other research teams. Thus, as with all scientific endeavors, it is of importance for other research teams to replicate the findings summarized in this article. Another limitation may be that the researchers conducting the current review are also associated with the aforementioned research team. As demonstrated in research on psychotherapy, researcher allegiance may introduce a source of bias in treatment outcome evaluations. However, the aims of the current review were not focused on evaluating the effectiveness of Oxford House as a treatment, but rather evaluating the research processes that have contributed to existing knowledge on Oxford Houses in hopes of stimulating further research on recovery residences.

There are certainly more questions about recovery residences that need to be examined. For example, there is a need for more studies evaluating the effectiveness of Oxford House versus other types of recovery homes. Recovery residences have been classified into “Levels of Support” by the National Association of Recovery Residences based on the intensity and duration of support that are offered to the residents (Jason et al., 2013), where a “Level 1” classification reflects minimal structure and supervision (such as an Oxford House) and a “Level 4” classification reflects a highly structured and staffed program.

There is a need for research that examines how many recovery residences exist in the United States, the geographic distributions of these residences, the factors that promote sustainability of these residences, the physical and social characteristics of residences, their long-term effects for residents, and the neighborhood’s effects on the residence and vice versa. Additionally, research is needed on which level of support is most appropriate for specific individuals. There is also a need for comparisons of long-term residential treatment programs, shelters, safe havens, transitional housing, incarceration, and homelessness programs. We hope that the quantitative and qualitative study designs and data analysis techniques delineated here can provide a framework for researchers to answer these critical questions in future research with recovery residences.

Article 10: Examining the effectiveness of a rational emotive personal-disclosure mutual-sharing (repdms) intervention of the irrational beliefs and rational beliefs of greek adolescent athletes

Methods

Participants were 20 Greek male adolescent athletes (Mage = 16.35; SD = 1.00), with 2–10 years of competitive experience in their sport (M = 2.46; SD = 2.8). Participants were football athletes (N = 16), tennis players (N = 2), a sailor, and a fencer. Participants represented all athletes in a sport talent program and were all pupils at the same school in Athens Greece. Convenience sampling was used to recruit participants, whereby information about the study was distributed to all sport talent program athletes, and participants volunteered to take part. The school was informed about the aims and procedures of the study, giving permission for the implementation of the study. Ethical approval was granted by the University, and informed consent and minor assent was gained from participants and their guardians before data collection.

The study employed a single-case AB and ABC betweengroups design (Barker, McCarthy, Jones, & Moran, 2011). More specifically, participants were randomly divided in two groups by flipping a coin, where both groups (REBT+REPDMS group, N = 9; and REBT only group, N = 11) received REBT education workshops, but only the REBT+REPDMS group received REPDMS. To be clear, the REBT+REPDMS group received four 40-min REBT education workshops, followed one week after by an REPDMS session (ABC single-case design). The REBT only group received only the four 40-min REBT education workshops (AB single-case design). Thus, it was possible to assess the effects of REPDMS over and above the effects of REBT education. Data were collected over a 12-week period through baseline (4 weeks), REBT education (4 weeks), REPDMS vs. no REPDMS (one week), and postintervention (three weeks) phases. Baseline data revealed a sufficient level of irrational beliefs to warrant REBT intervention (REBT+REPDMS group, M = 2.89, SD = .06; REBT only group, M = 2.91, SD = .10) based on reported average norms (M = 2.64) for the Shortened General Attitudes and Beliefs Scale (SGABS; Lindner, Kirkby, Wertheim, & Birch, 1999; MacInnes, 2003), and guidelines for using REBT with athletes (M = 2.51; Turner & Barker, 2014). In other words, participants in both groups reported above the norm for irrational beliefs, and therefore were eligible to take part in the study.

The Shortened General Attitudes and Beliefs Scale (SGABS; Lindner et al., 1999) comprises 26 items forming eight subscales. Total irrational beliefs (22 items) is made up of self-depreciation (4 items; e.g., If important people dislike me, it is because I am an unlikable, bad person), other-depreciation (3 items; e.g., If people treat me without respect, it goes to show how bad they really are), need for achievement (4 items; e.g., It’ s unbearable to fail at important things, and I can’t stand not succeeding at them), need for approval (3 items; e.g., When people who I want to like me disapprove of me or reject me, I can’ t bear their disliking me), need for comfort (4 items; e.g., It’ s unbearable being uncomfortable, tense, or nervous, and I can’t stand it when I am), and demand for fairness (4 items; e.g., It is awful and terrible to be treated unfairly by people in my life). A rational beliefs (4 items; e.g., I have worth as a person even if I do not perform well at tasks that are important to me) subscale is also included. For reasons of brevity, only total irrational beliefs and rational beliefs were included in the current study. Participants were asked to indicate the extent that they agreed with each of the 26 statements on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicative of stronger beliefs. The SGABS has shown high test-retest reliability in a general population (r = .91; Lindner et al., 1999) and youth athletes (r = .77 to .95; Turner et al., 2014) samples, and acceptable construct, concurrent, convergent, and discriminate validity (MacInnes, 2003). The SGABS was selected for the study due to its prior use in athletic contexts (Turner & Barker, 2013). Across all time points, Cronbach’s a for the rational beliefs subscale was medium and ranged from a = .28 to a = .89 (M = .55, SD = .23), however this value is explained by the small number of rational beliefs statements (N = 4; Nunnally & Bernstein, 1994). Although the SGABS offers only 4 statements for the assessment of rational beliefs, it was preferred to alternative measures (e.g., Rational Beliefs Inventory; RBI; Shorkey & Whiteman, 1977) due to its simplicity in translating into Greek in clear terms. To translate the SGABS, a researcher of Greek origin who is trained in REBT (Certified) and speaks fluent English translated each item from English to Greek. Then, the translation was validated by a third-party who is of Greek origin but whose main language is English. This third person translated the Greek SGABS items back into English. Any discrepancies between the researcher’s and the third party’s translations were discussed and reconciled to form an accurate Greek translation. Concerning irrational beliefs, Cronbach’s a ranged from a = .77 to a = .85 (M = .81, SD = .03).

All participants completed the SGABS at four time points before the intervention to establish the baseline, due to lack of variability anticipated in irrational beliefs (Barker et al., 2011), which should remain stable over short periods of time (e.g., Lindner et al., 1999). All participants received four 40-min REBT education workshops, with each workshop working to specific goals, in compliance with past research and guidelines for group-REBT (Dryden & Neenan, 2002; Dryden & Branch, 2008; Turner et al., 2015). Broadly, participants were educated on the basic notions of REBT and the ABCDE framework and the causal relationship between beliefs and emotions. Participants were also educated on the disputation of irrational beliefs and the promotion of rational beliefs.

Discussion

The present study has limitations that, if addressed, could strengthen the findings. First, there were time constraints for the intervention, which meant that participants were not fully exposed to all elements of REBT. Specifically, participants were not set behavioral homework assignments, such as flooding, and were not taught emotional strategies, such as rational-emotive imagery, in the REBT education workshops. Behavioral and emotional assignments REBT are considered to an important part of REBT, but it is necessary to monitor homework completion. But the group-level nature of the REBT intervention in the current study was logistically prohibitive with regards to setting and reviewing homework, as it would not have been possible within the time limits to review each participants homework as would be typical in one-to-one REBT. Therefore, without the scope to properly monitor and regulate homework adherence, and as is typical in group-level REBT (Turner et al., 2014; 2015), the assignment of homework was omitted in the current study. Nonetheless, the omission of homework could affect the quality of the REPDMS session. Researchers in sport should start to apply more comprehensive REBT programs, as short programs have been found to yield short-term benefits (e.g., Turner et al., 2014). Second, although participants volunteered for the study, their participation was not a result of a needs analysis. The effects of the intervention could be maximized by ensuring that participants present with high irrational beliefs at baseline, by screening athlete populations as part of the sampling process. In practice, REBT may be best applied to athletes who have high irrational beliefs to reduce the cost and time commitment for sports organizations, and ensures that all participants experience maximum benefits. However, away from a research paradigm, practitioners should be aware that REBT is not just a remedial approach to applied work, and can be used with any athlete who wishes to strengthen their current rational beliefs and learn to challenge and dispute their irrational beliefs.

Another possible limitation may have been that some participants were at different periods in their season. Some participants, such as the tennis players, had important competitions coming up after the REPDMS, while for others the season was almost over. Athletes who had no more competitions for this season may have engaged less in the program. But those who were still competing may have been highly engaged as there performance relevant emotions would have been more salient. Indeed, psychological and emotional states may change in the lead-up to competition, with for example increased somatic state anxiety intensity as the event draw nearer, and a stabilization in cognitive state anxiety (e.g., Cerin, Szabo, Hunt, & Williams, 2000; Mabweazara, Andrews, & Leach, 2014). In addition, participants were involved in various sports and it may be more ecologically valid to study athletes from the same team, such as in previous research (Turner et al., 2015), where similar activating events and irrational may be expressed. Future researchers should use a more homogenous sample of athletes from the same team at the same period of their competitive season. For example, Turner et al. (2015) completed a between-groups REBT program within the same cohort of athletes, including a control group, finding reductions in irrational beliefs for the REBT group and not for the control group. Finally, given that PDMS is in essence a team building intervention, future research should include measures of group dynamics (e.g., cohesion) as is typical in past research (Carron & Spink, 1993; Dunn & Holt, 2004; Holt & Dunn, 2006; Paradis & Martin, 2012), alongside markers of individual belief change.

It should also be recognized that social validation data were not collected in the current study, which deviates from past singe-case research (e.g., Turner et al., 2015). Social validation would have helped to interpret the data presented (e.g., Page & Thelwell, 2013), and may have reduced speculation as to the mechanisms of change in irrational and rational beliefs found in the current study. In PDMS research, qualitative data from participants regarding the process is potential important (Dunn & Holt, 2004), and inclusion of social validation in the current study may have aided the future administration of REPDMS. Future researchers should consider using social validation interviews (e.g., Page & Thelwell, 2013) with participants to provide a greater understanding of perceived intervention effects.

To conclude, the current study is the first published study to examine and support the use of REPDMS to reduce irrational beliefs and stabilize elevated rational beliefs in athletes. Indeed, no other published study has documented the use of REPDMS, thus giving the current study novelty within REBT and sport and exercise literatures. The present study is also the first published study to report the use of REBT with Greek athletes, thus extending the understanding of how REBT can be applied cross-culturally. This study contributes to the growing research concerning the use of REBT in sport settings, and especially contributes to the work reported within group contexts. The findings that REPDMS is able to reduce irrational beliefs and stabilize elevated rational beliefs compared with REBT education has clear implications for the provision of REBT in sport. The notion that sharing the REBT process in a PDMS session can enhance the effects of REBT may provide practitioners with a valuable tool for use in group-settings, and is a promising area for further study. It is hoped that the current study encourages other practitioners to apply REBT in their practice, and importantly, to report athlete experiences of REBT in literature.

Article 11: Teaching sport psychology for now and the future? The psychological uniform with high school varsity athletes

Methods

Female athletes from a varsity high school soccer team in California served as participants in the current case study. The roster listed 21 athletes, but due to injury, family obligations, academic deficiencies, and mandatory tutoring, only 18 participated in data collection. The athletes ranged in age from 14 to 17 years (mean = 16.28 years), and mostly identified themselves as Hispanic (N = 16). Other ethnicities identified included Black (N = 1) and White (N = 1). None of the athletes had previously participated in a formal sport psychology program or worked with a Sport Psychology Consultant (SPC).

The Head Coach (HC; white female) was also an important participant in the case study. She competed in soccer at both the community college and Division I levels. Though in her first year as HC of the varsity soccer program, she had formerly coached the varsity water polo and swim teams at the same school. When competing at the DI level, the HC had worked with a SPC and she was currently enrolled in a graduate program in Sport Psychology. Due to her strong connection to the study and the insights that she could provide, she joined the research team. She is the third author of the current manuscript, but is referred to as HC as her primary responsibilities were in this role.

The school is in one of the largest school districts within California. The school’s Athletic Director (AD) promotes coach development and has an ongoing mission to increase student-athlete participation, engagement, achievement, and retention. Coaches meet with the AD each season (i.e., preseason, during season, postseason) to discuss how they can integrate these core values in their coaching. After a planning meeting with the AD, the HC contacted the first author to seek assistance with providing sport psychology services to her athletes. Ethical approval for the use of human subjects was obtained from the lead author’s university as well as the school board.

During tryouts, once initial separation of teams (i.e., into Varsity, Junior Varsity, and Freshman) occurred, the HC led a discussion with the tentative Varsity team about the upcoming season, the mission to increase their engagement, and her decision to have them participate in a sport psychology/life skills curriculum (which will now be referred to as UNIFORM). She felt that the team’s participation in UNIFORM would benefit her athletes individually as well as the team as a whole. She communicated this message in team meetings and during tryouts. Players were provided assent and consent forms in English or Spanish. The HC then hosted a parent-athlete meeting to review the upcoming season, at which time the decision to use UNIFORM was again discussed. She explained her decision to have the team participate in UNIFORM and identified potential benefits of this engagement. No parents objected to this decision.

Discussion

A third limitation involved the research design. More specifically, the research design was a case study. The intact soccer team served as the experimental group and no control group was included. Though multiple sources of data point to the athletes’ use of the UNIFORM skills at posttest and follow-up, the absence of a control group makes it difficult to say with certainty that the experimental group’s positive results were a result of them being taught the UNIFORM curriculum and not some other factors. However, the use of a control group in an applied intervention setting is not always appropriate or feasible. As noted by Anderson, Miles, Mahoney, and Robinson (2002), “it is impractical to offer a service to one group of athletes and deliberately withhold the service from another group” (p. 437). This was the view of the AD whose mission was to increase student-athlete participation, engagement, achievement, and retention. He felt strongly that if two teams were to be included in the study, that they should both be taught the curriculum. However, due to timing, scheduling conflicts, the length of the curriculum (i.e., 12 weeks), and available resources only one team could be included. As such, the soccer team was a single case, and though the results are positive, they should be interpreted with caution.

Despite its limitations, the current study makes a contribution to the literature on the development of sport psychology and life skills in adolescent athletes. This has been identified as an important area of investigation with researchers studying life skills development of athletes via applied sport psychology interventions as well as the perceptions of coaches, administrators, parents, and the athletes themselves (Camiré et al., 2013; Sharp et al., 2013; Sheard & Golby, 2006; Trottier & Robitaille, 2014). It appears that a curriculum like the Psychological UNIFORM can be used to successfully teach sport psychology skills to adolescent athletes. Through multiple sport-themed, classroom-based activities and a physically active component, the athlete participants used several sport psychology skills according to the data collected during, and immediately following the curriculum period.

Few studies have measured athletes’ retention and use of sport psychology or life skills at a follow-up period after the intervention has been completed. In an effort to address this gap, data were collected at the 4-week follow-up point in the current study. The instrument used to measure the majority of the psychological skills taught within the UNIFORM curriculum was the TOPS (Thomas et al., 1999). This questionnaire is widely used to measure athletes’ application of sport psychology skills in practice and competition. At the time of the 4-week follow-up, the soccer season had ended. However, analysis showed some significant findings, even at a time when many athletes had no opportunity to use the skills in a practice or competition setting. Data from the EIS support these positive outcomes and are encouraging; they suggest that athletes who were finished soccer, but involved in other sports (e.g., lacrosse) maintained their sport psychology skills, and also that the athletes applied the skills to other areas of their life such as school, and when dealing with relationships. Thus, the current study makes a contribution by advancing the knowledge related to teaching sport psychology and life skills in the high school athletic setting in meaningful ways such that athletes use the skills during, but more importantly after, the conclusion of the intervention program. Regardless, researchers should consider using longer follow-up periods to determine the extent to which the athletes can retain their skills over greater time periods following the completion of the intervention program.

Given adolescent interest in sport and the accessibility to athletes, the high school site appears to be a fertile context in which to teach sport psychology and life skills to adolescent athletes (Camiré, 2014). If integrated into training sessions, the GPF activities have the potential to be more authentic and engaging. As noted by a high performance coach, “interactive” activities were most effective in helping athletes learn life skills (Hardcastle et al., 2015). Regardless of the teaching organization athletes can and should be taught to use sport psychology and life skills. Though there is not one “correct” way to do this, with its multimethod approach and sport-themed activities, the Psychological UNIFORM appears to be an effective vehicle to accomplish this task.

Article 12: Predicting complex syntactic structure in real time: Processing of negative sentences in Russian

Methods

Twenty-eight Russian-speaking volunteers (age 18–35 years) gave informed consent to participate in the study. All participants were students who were at or had graduated from a university, had normal or corrected vision, and reported no history of language disorders. They were tested on the premises of Moscow State University or St Petersburg State University.

Twenty-eight Russian-speaking volunteers (age 18–35 years) gave informed consent to participate in the study. All participants were students who were at or had graduated from a university, had normal or corrected vision, and reported no history of language disorders. They were tested on the premises of Moscow State University or St Petersburg State University. Material B) that followed the same sentence structure as that shown in (3). For the completion task the sentences such as (3) were truncated after the second or the third NP, yielding two accusative and two genitive conditions listed in Table 1. Across all sets, the critical second NP was an inanimate plural noun in order to avoid ambiguity between genitive and accusative forms found in other Russian nouns (see Footnote 2).4 Participants had to provide a natural completion for each sentence fragment (they were instructed to skip any fragments that they considered ungrammatical). If Russian speakers can resort to genitive-of-negation in order to license a genitive NP, continuations containing a negated embedded verb in both genitive conditions should be expected. The rate of such completions was predicted to be lower in the Gen-only condition than in the Gen+Dat condition, as the former also allows a completion with a monotransitive quirky verb that takes the genitive NP as a direct object. The two accusative conditions were used for estimating a “baseline” rate of negative completions in a case where either an affirmative or a negative continuation is available

Each participant filled out a paper questionnaire with 20 sentences to complete—that is, eight experimental sentences (two items for each of four conditions in Table 1) interspersed with 12 filler sentences.

Discussion

A final point before discussing the implications of the findings for parsing theories is that whereas the results demonstrate that the parser anticipates negation as a licensor for the genitive NP, they are not conclusive as to whether alternative licensors are considered in parallel. Recall that in the offline sentence fragment completion task (Experiment 1) alternative licensors for the genitive NP (in particular, adverbs) were offered, albeit infrequently. This, together with an active prediction of a negated verb in the online task, indicates that in the current stimulus set the combination of grammatical, word-order, and frequency considerations disfavours most alternative licensors. Yet, I remain agnostic whether, during online processing of the experimental sentences, the few remaining possibilities (in particular, numerals or adverbs) are fully disregarded or whether they are considered in parallel with the genitive-of-negation structure.

As mentioned earlier, the results from Experiments 2 and 3 are notable as they point to anticipatory projection of multiple heads—that is, the verb and negation. Thus they argue against strongly bottom-up approaches to structure building such as headdriven parsing models (Abney, 1989; Mulders, 2003; Pritchett, 1992) by demonstrating that the verb and negation heads are projected ahead of bottom-up input on the basis of preverbal arguments. Most previous research demonstrated prediction of a verbal head in head-final languages in which such prediction could potentially be viewed as a last resort response to a ubiquitous necessity to deal with preverbal arguments, as unattached NPs would regularly result in a significant working memory load. The current demonstration that verb heads can be predicted in Russian, a non-head-final language, is notable and suggests a wider role for predictive structure-building algorithms (see also Pablos, 2006, for Spanish, Omaki et al., 2015, for English wh-dependencies). In particular, the standard left-corner parsing algorithm (Abney & Johnson, 1991; Stabler, 1994, among others) in combination with lexicalized grammar can be used to explain the results. The left-corner strategy has a top-down predictive component that operates as follows: Once the first constituent of a phrase is recognized in the bottom-up input, the prediction of a subsequent constituent can be triggered on the basis of a syntactic rule. For example, once a NP is formed bottom-up (e.g., The boy . . . ), the rule S → NP + VP is invoked, of which the NP is the left-hand-side constituent (i.e., “left corner”), which in turn triggers projection of a VP ahead of bottom-up input. In the accusative condition, upon encountering the accusative and dative NPs in the bottom-up input, the parser predicts a ditransitive verb using VP → V + NPACC + NPDAT rule (recall that in Russian word order is flexible, and hence NPACC + NPDAT can appear before the verb and serve as a left corner) and incorporates the preverbal NPs into a connected structure. Negation is not actively predicted in the accusative condition on the basis of this rule and must be added into the parsing tree on the basis of bottomup input. In the genitive condition, when NPGEN is encountered it can trigger prediction of a quirky verb (on the basis of VP → V + NPGEN rule), another nominal (NP → N + NPGEN), adverb (AdvP → Adv + NPGEN), or negative phrase with a transitive or intransitive verb NegP → Neg + V + NPGEN or NegP → Neg + V + NPGEN + NPDAT using a left-corner strategy (NPGEN is a valid left corner in all these cases as the nominal arguments can precede the head). The appearance of the NPDAT in the bottom-up input invalidates all alternatives except for the latter. Note that in the case above, postulating a lexicalized genitive-ofnegation rule NegP → Neg + V + NPGEN (+ NPDAT) is critical for rendering NPGEN into a left corner that can trigger projection of negation and verb.

As an alternative to the account above that assumed a lexicalized rule NegP → Neg + V + NPGEN (+ NPDAT), the genitive-of-negation may be encoded as a combination of structural rules in a grammarbased parser. In this case there is a rule NegP → Neg + VP and a rule whereby the structural accusative case on the verb’s direct object changes to genitive. In addition, the parser should be aware of the split licensing pattern whereby case and thematic role (on NPGEN) are not assigned by the same head. These considerations on what a parser should be able to achieve will hopefully trigger further research from grammar-based parsing theorists.

In conclusion, the findings demonstrate that in Russian, a free-word-order language, morphological case information is used by the parser for predictive structure building when it is available in the input ahead of information about the heads. Such an anticipatory mechanism allows projection of multiple lexical heads when a single head is insufficient for incremental incorporation of the bottom-up material into the parsing tree.

Article 13: An exploration of trainee practitioners’ experiences when using observation

Methods

Interpretative phenomenological analysis (IPA; Smith, 1996) is rooted within, and combines both phenomenology (descriptive element) and hermeneutics (interpretive element; Pringle, Drummond, McLafferty, & Hendry, 2011). IPA reflects the authors’ views of constructivism in which the individual and the world are viewed as coconstructing rather than two separate bodies, wherein the researcher plays an interpretive part (Davidsen, 2013; Palmer, Larkin, De Visser, & Fadden, 2010). IPA was chosen as the qualitative approach for this study owing to the central position placed on an individual’s lived experience and their resultant sense-making of these experiences (Smith & Eatough, 2012). Alternative means of data collection have begun to adopt methods of IPA, namely focus groups (Palmer et al., 2010; Tomkins & Eatough, 2010). Using an approach through which multiple perspectives of a given phenomenon can be shared is considered to uncover both implicit thoughts and subconscious opinion (Tomkins & Eatough, 2010). As a result, focus groups can build a deeper experiential understanding of a given phenomenon due to the dynamic interplay between participants (Liamputtong, 2011).

Supervisors associated with either the BPS or BASES, were identified via their accrediting body’s website, and emailed to request permission to contact their supervisees. Primary contact with supervisors was intended for recruitment of individuals from the same supervisory group. It was considered that participants sharing the same supervisor were likely to have had previous group reflections and would not therefore be averse to sharing knowledge and experiences in a discursive environment. In some instances supervisors did not run group supervision; however this method of contact enabled greater ease when organizing focus groups due to participants residing in relative proximity to each other.

In total 16 supervisors across England and Wales were initially contacted. Due to nonresponse, or difficulties organizing a suitable date and time for all individuals, the final participant sample represented eight supervisory groups. All participants were enrolled on a training program toward either chartered psychologist (BPS) or an accredited sport and exercise scientist (BASES). The final sample of participants represented a homogenous group to align with IPA guidelines (Smith & Eatough, 2012). Across the sample were minor discrepancies between participants, including group and individual supervision, as well as variation in the stage of training, i.e., at the start, middle, and end of this process. Following institutional ethical approval and informed consent, the sample included seven males (age: M = 31.71 years, SD = 9.32 years), and 12 females (age: M = 25.33 years, SD = 1.37 years), creating five focus groups, comprising between three to five participants. Liamputtong (2011) and Litosseliti (2003) advise that smaller participant numbers in focus groups elicit greater contribution from each member, allowing for better articulation of opinion.

A natural human behavior is to discuss perceptions and opinions of specific topics in a group setting; consequently focus groups appeal to the ordinary conversation and social interaction of everyday life (Colucci, 2007; Litosseliti, 2003). Heightened interaction and sense making between participants therefore create opportunity to uncover implicit perceptions regarding observation experiences (Liamputtong, 2011; Tomkins & Eatough, 2010). To align with the principles of IPA, the researcher adopted the role of a moderator and ensured that focus groups were participant-led (Smith & Eatough, 2012). Through assuming a position as moderator, the researcher can actively engage participants and encourage discussion between group members, rather than between moderator and participant (Liamputtong, 2011).

Discussion

Considering observation is a skilled practice it is alarming to find trainees have received minimal to no formal training in it. Evidence from trainees suggests they are implementing observation; however there is resounding indication this is founded on instinct and trial and error learning, rather than evidence-based practice as is endorsed by governing accreditation bodies (i.e., BPS and BASES). It is fair to assume that at this stage of a trainees’ career, observation skill is relatively low, therefore training in this much valued assessment should be essential. Proposed formal observation training was met with unanimous consensus across all trainee participants, explicitly showcasing the merit in providing such a platform of education. Most salient was the suggestion from trainees to focus on the how of observation as opposed to what and why. This conviction is supported through Brown et al. (2005) claiming current applied sport psychology training as being proficient in the development of individual techniques (i.e., what and why), but which is not adept at educating practitioners in navigating the complexities of an ever-changing sporting context (i.e., how). It is anticipated the sharing of experiences and knowledge from a varied range of practitioners, will enable reflective discussion and take home messages regarding associated challenges such as, coping with the demand of multiple variables (i.e., teams), distraction, documentation, and perception. Attention should also be given to developing an understanding of contextual intelligence and its propensity to open doors to generate greater effectiveness in applied delivery.

Practical recommendations for enhancing observation practice have been interspersed throughout this discussion. We feel it is critical that our clients are educated on the purpose and intention of observation in an attempt to dispel any negative association or discomfort linked to being observed. By selling its positive implications, it is anticipated that applied practitioners will be less inclined to conceal observation, and instead confidently observe and integrate themselves into the sporting environment. Resultant immersion into the client’s environment is recommended to help build a contextually intelligent practitioner. An increased presence, via informal observation, facilitates a deeper understanding of the complexities of a specific sporting culture, allowing practitioners to more effectively design and implement intervention. Furthermore, it is recommended to be seen in the sporting environment outside of ‘normal’ working hours in an outward display of enthusiasm and interest. Both the client and key stakeholders within the sporting organization are likely to be recognizant of this which is suggested to increase acceptance and strengthen relationships.

It is important to reflect on possible limitations of the study. Consideration is given to the combined participant sample of individuals supervised from two different accreditation systems with differing outcomes and training structures (i.e., BPS and BASES), and the potential impact this may have had on individual experiences. Reflecting on each focus group and their responses to questions regarding previous observation training, it was considered that all participants, regardless of background or training pathway produced similar answers. Thus authors felt that all participants had similar foundations in observation knowledge irrespective of which accreditation system they were affiliated with, and therefore the differences in supervision across both training pathways would be minimal. Secondly, it is recognized that a wider group of trainees from a bigger sample of supervisors across the United Kingdom may provide a better representation than drawing from a small cluster of supervisors. Lastly, it is important to consider the impact of researcher bias on the interpretation of data. Due to the relatively small community of trainee practitioners’ within the United Kingdom, the lead researcher had professional connections with some of the participants used in focus groups. However, to minimize the effects of potential researcher bias, a reflexive journal was kept in which the lead researcher acknowledged any bias and unintentional influence upon data collection and interpretation.

The most influential message to have emerged from this study is that observation is perceived to add substantial value to service delivery, which is currently vastly under acknowledged. Positive properties already associated with observation, such as triangulation and confirmatory evidence (Watson II & Shannon, 2010) has been largely reinforced, however findings have uncovered other significantly valued traits of observation. A running undercurrent throughout this discussion has been the role of contextual intelligence as an avenue worthy of much greater exploration due its potential for unlocking many of the perceived challenges already attached to observation. Exposure and raised awareness of these associated challenges (i.e., trainee preconceptions and perceptions of others) is imperative for the advancement of our profession. Future research should be directed toward the development of observation training if the profession of applied sport psychology is to aspire and develop toward an ever effective and successful discipline.

Article 14: Need to screen for clinical levels of ocd? Four questions are the key

Methods

Participants were recruited in three ways: (1) online (n = 298), from three OCD-related websites (International ObsessiveCompulsive Disorder Foundation, the Houston OCD Program, and the Peace of Mind Foundation); (2) a residential treatment facility (n = 127), the Houston OCD Program; and (3) in person at consumer conferences of the International OCD Foundation (n = 100). All participants completed a battery of measures, including demographic information and assessments for OCD severity. The residential treatment center used in the current study utilizes a structured diagnostic interview at the onset of treatment, the Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998), as well as expert clinical assessments conducted by licensed clinicians specializing in the treatment of OCD. The results of the online and consumer conferences were aggregated across two separate studies. Not all participants completed all of the measures of OCD severity because of responses being collected from separate studies requiring completion of differing measures from their participants (see Table 1). Participants in the online and residential treatment groups were asked to complete the Y-BOCS-SR, the OCIR, and the DOCS, while the conference group was given only the Y-BOCS-SR and the DOCS. Of the original 575 participants recruited, 525 met criteria for study inclusion. Participants were excluded if they were under that age of 18 or did not complete both the WHOS and at least one OCD severity measure. Demographic information is displayed in Tables 2 and 3. Participants were primarily female (60.1%), with a mean age of 34.0 (SD = 12.7; range 18–80). Participant race/ethnicity was 82.7% White, 4.4% Hispanic American, 3.6% Asian/Pacific Islander, 1.9% African American, and 7.5% Other or Withheld.

Yale-Brown Obsessive Compulsive Scale–Self-Report (YBOCS-SR). The Y-BOCS-SR (Steketee, Frost, & Bogart, 1996) is a 10-item self-report scale measuring OCD severity. Items are rated on a 5-point scale from 0 to 4, assessing for time burden, interference, distress, resistance, and control over both obsessions and compulsions. Total scores range from 0 to 40, with scores at or above 16 commonly used as the clinical cutoff for OCD. The Y-BOCS-SR displays good psychometric properties (Steketee et al., 1996).

Obsessive-Compulsive Inventory-Revised (OCI-R). The OCI-R (Foa et al., 2002) is a shortened, 18-item version of the original OCI (OCI; Foa, Kozak, Salkovskis, Coles, & Amir, 1998), measuring OCD severity. Items are rated on a 5-point Likert scale (0 = Not at all to 4 = Extremely). Total scores range from 0 to 72, with scores at or above 21 considered indicative of the likely presence of OCD. The OCI-R displays good psychometric properties.

Dimensional Obsessive-Compulsive Scale (DOCS). The DOCS (Abramowitz et al., 2010) is a 20-item self-report scale that assesses OCD severity dimensionally, including contamination, responsibility for harm and mistakes, symmetry/ordering, and unacceptable thoughts. Each subscale consists of 5 items rated 0 to 4 that assess time burden, avoidance, distress, life interference, and difficulty in disregarding or refraining from obsessions and/or compulsions. Total score ranges from 0 to 80, with scores at or above 18 considered indicative of the likely presence of OCD. The DOCS displays good psychometric properties.

Discussion

The current study’s sample size was far greater than previous screener studies (Farvolden et al., 2003; Gega, Kenwright, Mataix-Cols, Cameron, & Marks, 2005; Storch et al., 2007). Unlike other studies that solely used undergraduate participants (Coles et al., 2007), the current study carefully selected established OCD websites and consumer conferences for individuals with OCD. Given that consumer conferences require time and payment by attendees, it is unlikely that individuals who attended and participated in the study were malingering. Where as other screening tools have been lengthy or difficult to read (Donker et al., 2009), the WHOS is brief, lowering participant burden. This brief screening tool may help screening for clinical purposes or research study completion and not “rule out” those without clinical levels of OCD, saving the screeners time and effort. The ease of administration, scoring, and interpretation, gives the WHOS an advantage over other screening tools that require arduous scoring and professional interpretation (Farvolden et al., 2003). In addition, the WHOS is free and readily accessible to clinicians and researchers, whereas many other screening tools are only available by purchase.

The WHOS is a useful measure when a clinician needs a brief screening or a researcher wants to reduce participant burden and in-person clinical diagnoses are not available. Given that the Internet has become a widespread venue for conducting research, it is imperative that a valid screener is used to determine OCD study inclusion and exclusion. We believe the WHOS has the potential to facilitate future research on OCD and improve the validity of online research, especially if future studies can validate how it compares with structured clinical interviews.

Despite the diversity in recruitment strategy and large sample size, there were limitations with the current study. The study lacked participant diversity in race/ethnicity, and evidence for differences in OCD severity across these groups is growing (Williams, Elstein, Buckner, Abelson, & Himle, 2012). The study would also benefit from conducting the screening with participants who are less familiar with OCD, such as university students or a clinic that treats an array of disorders. In doing so, the ability of the screener to detect OCD in a general population is likely to be strengthened.

Test–retest reliability and correlation to diagnoses established by structured clinical interviews were also absent from the present study. To improve validity, future research should include a greater number of measures taken across all groups. The screening should also be conducted in more diverse venues of treatment-seeking populations (e.g., standard outpatient settings, non-OCD-specific clinics) as well as with participants from the general population and in comparison with a healthy control group. Although the WHOS has promise, we hope this initial investigation will spark more research to establish its validity and utility.

Article 15: Prediction of psychiatric hospitalization, diagnoses, arrests, and violent behavior through scored drawings and associations

Methods

An archival sample of 402 subjects was used in this study. Table 1 presents the characteristics of this sample. As may be seen from the table, the sample is balanced among African-American (36%), Latino (16%), and Caucasian (48%) subjects. Gender balance is 52% female and 48% male.

The following criterion measures were obtained from subjects’ case files: ever diagnosed psychotic, ever diagnosed depressed, ever diagnosed with bipolar disorder, ever diagnosed with borderline personality disorder, and ever diagnosed with antisocial personality disorder. All diagnoses were made by examining psychologists or psychiatrists, documented in professional reports on the subjects. Criteria relating to events in the case history include: ever hospitalized for psychiatric treatment, number of arrests, ever incarcerated in a county jail, and history of violent behavior (including domestic violence, assault/aggravated assault, or homicide). Additionally, in the item development phase, individual items were correlated with either the Millon Clinical Multiaxial Inventory (MCMI)-III scales or Personality Assessment Inventory (PAI) scales cited below. For subjects who had been administered both instruments, only one was employed as a criterion variable.

All records were selected from files accumulated in private forensic psychology practice. All subjects had presented for a psychological evaluation relating to a legal matter. The most common case type was child protective services matters, followed by criminal matters, followed by assessments for professional boards, followed by tort cases. Criteria for case selection in the item development phase included at least one psychological or psychiatric evaluation containing a diagnostic section, adequate case material to document criminal history, drug use, child abuse and other factors, and administration of either the MCMI-III or PAI and the House-Tree-Person as part of an evaluation. Criteria for the cross-validation sample included at least one psychological or psychiatric evaluation containing a diagnostic section, adequate case material to document criminal history, drug use, child abuse and other factors, and administration of the House-Tree-Person. Intellectually disabled subjects were not included in either sample.

One hundred and sixty subjects in the item development sample had been administered the PAI (Morey, 1991) as part of a psychological examination. The main psychopathology scales (as opposed to subscales) and two PAI impression management scales measuring fake-bad and fake-good response sets were recorded for these subjects. Ninety-two subjects in the item development sample had been administered the MCMI-III (Millon, 1997), also as part of a psychological examination. All scores on the MCMI-III were recorded for these subjects. These measures were employed during the preliminary item development phase, and their specific relationships with drawing variables are not reported here.

Discussion

The use of Bayesian methods with this type of drawing predictor disposes of a methodological problem associated with the Hathaway and McKinley empirical item selection procedure discussed above. Selecting items for particular scales based solely on their correlation with a particular diagnostic group necessarily takes a toll on internal consistency. Dyer (1997) points out that the MMPI-2 manual lists coefficient alpha values that are only in the .50 s for five of the 10 basic scales. Heilbrun (1992) lists a reliability figure of at least .80 among the seven criteria for psychometric adequacy of assessment instruments used in forensic settings. In the case of Bayesian aggregation of individual predictors, however, it is essential that they not be highly correlated, in order to avoid artificially inflated posterior probability values (McGrath, personal communication, July 26, 2012).

One psychometric issue discussed in Lilienfeld et al. (2000) is that of incremental validity. Lilienfeld et al. stated that they are unaware of any research that demonstrates that HFDs offer psychologically useful information beyond that provided through other types of evaluation data, including the restandardized MMPI-2, psychiatric interviews, and demographic data. It has been the author’s experience that subjects referred for forensic assessment are often highly guarded and defensive, concealing important elements of their personal histories in the clinical interview and responding to self-report clinical personality testing with extreme positive impression management, often to such an extent as to render the test record uninterpretable except as an indicator of defensiveness. It would therefore be highly informative to examine the incremental validity of drawing indicators over such self-report personality test scales as the PAI Violence Potential Index against actual criteria of violence. Many other incremental validity analyses could be designed that, if demonstrating a significant improvement in validity over self-report measures alone, could assist forensic psychologists in overcoming problems related to guardedness and positive impression management in responding to instruments such as the PAI, MCMI-III, and MMPI-2.

Ideally, drawings from the present forensic/clinical sample should be compared with a community sample to determine frequency of individual drawing indicators in the general population. This would also bring operating characteristics of the procedure in line with the statistics of the general population and permit a more naturalistic study of the instrument’s relatively low SPEC, which is presently a significant limiting factor with respect to the obtained validities. Incorporating the results of such a study into practical applications in forensic assessment would entail making a choice between the psychometric approach of scales such as the Millon Clinical Multiaxial Inventory-III, normed on an exclusively clinical sample in the interests of generalizing to clinical assessment, and scales like the PAI that also include a community sample.

The use of drawings and associations with demonstrated empirical validity allows for culture-free evaluation in forensic contexts where subjects do not possess a sufficiently high reading level in English or in their native language to permit the administration of self-report tests such as the MMPI-2, MCMI-III, and PAI. Additionally, the lack of structure of drawing methods deprives subjects of cues as to how to respond. This characteristic has the potential to reduce impression management, in contrast to self-report inventories where the social desirability of item responses is usually apparent to even moderately sophisticated examinees.

Article 16: Companion Animal Death: A qualitative analysis of relationship quality, loss, and coping

Methods

The purpose of the current study was to understand the lived experiences of grieving companion animal owners. Therefore, a qualitative research design utilizing a phenomenological perspective was employed. Institutional review board approval was obtained prior to commencing the research.

The term companion animal is used in this study to refer to domesticated animals who are cared for by and in close relationship with humans. For this study, owners of cats and dogs and one horse participated. Horses are primarily considered livestock, but secondarily also may be considered as companion animals. Participants were recruited from two Midwestern University locations through a companion animal loss support group and an organization within a University Foundation that assists with the memorialization of individuals’ former companion animals. Eleven qualitative interviews were conducted with 10 individual interviews and one couple interview. There were seven female and five male participants, all identifying as Caucasian. The age range was from 44 to 91 years (M ¼ 61.83 years). The education level of participants included one doctorate, two master’s, four bachelor’s, and one associate’s degree, three with some college and one with a high school education. The type of animal loss discussed in the interviews included six dogs, five cats, and one horse.

Participants were invited to complete a semistructured interview regarding their experience with the loss of a companion animal. An interview guide was used to elicit responses. Interviews occurred via phone and in person. The structure of each interview was informed by the research questions. The research questions included the following content areas, as related to the participants’ experience with companion animal loss: (a) description of and relationship with companion animal (and animals in general), (b) circumstances of the loss, (c) experience with veterinarian, (d) responses of support system (family and friends), and (e) experience of grief and healing process. While participants were given no incentive to participate, many reported at the end of the interview gratitude for the opportunity to share the story of their loss about their beloved animals.

A retroductive analytic strategy (Burr, 1973) was utilized to concurrently acknowledge the existing literature and the new information provided by participants. Retroduction involves the usage of both deductive and inductive strategies. Deduced hypotheses from the existing literature and theory were used to initially analyze the data. This supports the usage of the interview guide which was developed based upon the researchers’ clinical expertise in conducting therapy with grieving companion animal owners and the existing literature on companion animal loss. In addition, the coders inductively analyzed the transcripts allowing for new themes to emerge, while still viewing those new themes within the original deductive framework. This analytic strategy was deemed most appropriate for this research as it permits usage of existing literature as the basic framework from which to view the data but also offers flexibility for new themes to emerge so that gaps in the literature can be filled.

Discussion

Another contrast to human loss comes with honoring and memorialization of the loss. With human loss, many of the honoring activities are more expected (e.g., funeral, body care, obituaries). Of course, with companion animal loss, these options are less prescribed or expected. Participants from this study described their personal journeys to honoring and the associated benefits that resulted. The authors’ numerous anecdotal experiences support the true power associated with finding ways to honor. Some may struggle with not having expected ways of honoring as there are with human loss. Having discussions in advance acknowledging this and encouraging an “embracing” of the flexibility might be beneficial. As those grieving realize that the benefit of more flexibility is that the honoring can be more personalized and meaningful, they will “embrace” the unknown. Finding ways to memorialize the loss seemed particularly important for most research participants whether this was in a personal way or came through more formal ways initiated by veterinarians or family and friends. The absence of acknowledgement by loved ones appeared to detract the most from participants’ healing. As such, it is recommended that support persons already engaged in these honoring activities make efforts to include and invite other loved ones to participate.

The sample for the current study was a convenience sample recruited from a companion animal loss support group and an organization that assists with the memorialization of individuals’ former companion animals. As such, the participants may be more likely to value social support and memorialization processes than the general population of companion animal owners. The sample was also limited with regard to region, age, and race. The participants were recruited from two Midwestern cities, were mostly from older generations with a mean age of 61.83 years and were all Caucasian. More research is needed with a broader population in order to capture demographic differences and the range of coping methods found to be most helpful.

Additionally, the amount of time following the loss of the animal was not measured in this study. Future longitudinal research is needed to track the progression of grief and healing processes over time and to examine the impact of different types of positive social support on intensity and duration of grief following companion animal loss. This research could be used to enhance psychoeducational information available to veterinary and helping professionals and individuals experiencing companion animal loss and their loved ones.

The current study supports both the salience and uniqueness of human–animal relationships through this in-depth examination of relationship quality, loss, and coping. Comparisons to human relationships help to contextualize the salience of human–animal relationships. Emphasis on uniqueness highlights needs particular to individuals who have experienced the loss of a beloved companion animal. Grief is a universal process that is experienced when any significant loss occurs that is central to one’s identity. The companion animal relationships described by participants in this study appeared to not only be central to their identity as an individual but also part of their larger family and support systems.

Article 17: Level of physical activity, well-being, stress and self-rated health in persons with migraine and co-existing tension-type headache and neck pain

Methods

Two hundred persons with migraine aged 18-65, screened for exclusion criteria and who initially accepted participation were consecutively recruited from a tertiary referral headache centre between February 2014 and March 2015 148 (74%) returned the questionnaires and were included in the study (Fig. 1).

Exclusion criteria were: whiplash injury, significant neck trauma (defined as a history of trauma to the neck, fracture, distortion and violent attack which have caused the current NP), post traumatic headache, medication overuse headache, cluster headache, trigeminal neuralgia, pregnancy and/or breastfeeding, severe physical and/or mental diseases, abuse of alcohol or drugs and inability to speak or understand Danish.

Between June 2014 and October 2015, 100 headache free and healthy controls were recruited among hospital staff by modified snowball sampling and advertisement. Exclusion criteria were abuse of alcohol or drugs, inability to speak and understand Danish, regular intake of analgesics, NP and TTH frequency ≥1 day per month.

The healthy controls were matched to the included persons with migraine by the average value of age and the percentage distribution of sex.

Discussion

Self-report on physical activity, psychological wellbeing, stress and self-rated health may increase the risk of recall-bias. Personal interview is stronger than selfreport in reducing recall bias, and might have prevented the exclusion of participants who had inadequate answers in the IPAQ questionnaire. The drawback is that interview may cause interviewer bias. Prospective diary recording of migraine and co-existing TTH and NP together with personal interview may have been more ideal as diagnostic tools [44].

Detailed history and diary recording are particularly important for ascertaining multiple diagnoses. In the future, a larger sample of participants would allow for separate analyses of those with migraine only and migraine with either co-existing TTH or NP. This would also allow controlling for migraine disability.

There is a risk of losing power when collapsing responses into few categories, however, these categories are more informative and easier to explain to patients.

Migraine and co-existing TTH and NP was highly prevalent in a clinical sample of persons with migraine. Persons with migraine and co-existing TTH and NP reported significantly lower level of physical activity and psychological well-being; higher level of perceived stress, and poorer self-rated health than healthy controls. Persons with migraine and co-existing TTH and NP reported a reduced ability to perform physical activity owing to all three conditions with migraine as the most burdensome condition followed by TTH and NP. Persons with migraine and co-existing TTH and NP may require more focused interventions to increase physical activity. Whether physical activity is a beneficial treatment modality for this group is not known, and should be investigated in a clinical trial.

Article 18: Multiple attentional sets while monitoring rapid serial visual presentations

Methods

Sixteen undergraduates recruited from the subject pool at the National Institute of Advanced Industrial Science and Technology (Tsukuba, Japan) participated for pay in this and the following Experiments 2–5. All participants reported normal or corrected-to-normal visual acuity and normal colour vision.

In this and the following experiments, stimuli were displayed on a CRT monitor controlled by a computer using MATLAB software and the Psychophysics Toolbox (Brainard, 1997; Kleiner, Brainard, & Pelli, 2007; Pelli, 1997) at a viewing distance of approximately 60 cm. The stimuli were adapted from those used in a typical temporal letter-search task with peripheral distractors (Folk et al., 2002; Leber & Egeth, 2006). The stimulus sequences consisted of letters selected randomly from the English alphabet, excluding I, O, Q, and Z, with the constraint that the letter selected was not one of the two immediately preceding items in both streams and that the two concurrently presented letters differed from each other. One stream was presented 1.2° above the centre of the screen, and the other steam was presented 1.2° below the centre. The letters appeared in BorisBlackBloxx font and subtended a visual angle of approximately 1.0° in height and 0.8–1.2° in width (stroke = 0.2°). The target colour was chosen from among blue (RGB palette value: 0, 0, 255), orange (255, 102, 0), magenta (255, 153, 204), cyan (0, 204, 255), dark yellow (128, 128, 0), purple (128, 0, 128), and red (255, 0, 0). Two colours were chosen from the rest for the non-target items in the two streams: one colour for the top stream and the other for the bottom. The distractor frame consisted of six hash signs (i.e., #) of the same height as the letters, flanking both streams and the central fixation point (2.0° to the right and left, see Figure 1). One of the hash signs in the middle row (right or left side, determined randomly on every trial) was yellow (255, 255, 0), green (0, 255, 0), or the same colour as the target. The other hash signs in the distractor frame were grey (128, 128, 128). All stimuli were presented on a black background.

Observers were instructed to maintain fixation at the centre of the screen and to identify an oddballcoloured target that appeared unpredictably and with equal probability in either the top or the bottom stream. Each trial started with a 500-ms fixation display of a dot (0.1° × 0.1°) in the centre of the screen once the observers pressed the space bar. Two rapid sequences of 20 letters appeared simultaneously above and below the fixation point following a 500- ms blank interval (Figure 1). Target colour was assigned randomly from seven possible colours (blue, orange, magenta, cyan, dark yellow, purple, and red were used for half of the observers; green was used instead of red for the other half). The colour of the target and that of non-target items in the two streams differed from each other. The colours were randomly assigned during every trial. As a result, observers were forced to adopt the singleton-detection mode for each stream because they were not informed of the target colour for every trial. The target was chosen randomly from the letters, and the nontargets were chosen from the remaining letters without selecting the same letter in successive frames. The temporal position of the target varied randomly from item 12 to 15 of the stream. Each item was presented for 67 ms, followed by a 50-ms blank interval before the next item was presented, resulting in 117 ms of stimulus onset asynchrony. The onsets and offsets of the items in the two streams were synchronized. Following the study by Folk et al. (2002), a distractor frame, when present, preceded the target frame by two frames (233 ms). The side on which the oddball-coloured distractor (singleton) appeared was determined randomly from trial to trial.

The critical independent variable was the type of distractor. Under the same-colour condition, the distractor singleton was the same colour as the target of that trial. Under the different-colour condition, the colour of the distractor singleton (green, yellow, or grey) differed from the target. No distractor was presented under the distractor-absent condition, which served as a control. Observers were required to ignore the distractors and identify the target letter by pressing a corresponding key on the keyboard after all stimuli were presented. When an incorrect response was made, an alarm sounded through headphones. The same number of trials (120 trials) was assigned for each of the three conditions, and the trials were randomly ordered throughout the experimental session. Observers participated in 24 practice trials before the start of the experimental trials. To familiarize observers with the procedure, practice began at a very slow presentation rate, with the rate gradually increased to full speed for practice trial 12. The accuracy scores for the practice trials were excluded from analyses in this and the following experiments.

Discussion

The present results address two issues of theoretical importance. First, they provide strong support for a view involving the roles of spatial precision and flexibility in the splitting of attentional sets. As described in the introduction, a number of researchers have argued that the visual system can be configured in such a way as to maintain attentional sets for two different features at two separate spatial locations. For example, Adamo et al. (2008) asked observers to search for a green item on the right or a blue item on the left. The target was preceded by a non-predictive cue that shared the same location and/or colour as the target. Reaction times for target discrimination were shorter when the colour and location of the target were consistent with those of the cue. The researchers suggested that separate attentional sets can be concurrently maintained at two spatial locations. However, other studies have provided evidence against the configuration of such localized attentional sets for multiple features. For example, Becker et al. (2015) implemented a task that was conceptually similar task to the one used by Adamo et al. (2008), with the exception that the target was spatially accompanied by non-target items. The accuracy of target identification was impaired by the appearance of a distractor item whose colour was the same as the potential target in the other hemifield. Becker et al. argued that when splitting is required, attentional sets are applied globally rather than restricted to a specific hemifield. We argue that Adamo et al.’s and Becker et al.’s tasks may not be optimal for examining the spatial precision of attentional splitting because of the possibility that distractors would appear at potential target locations. It is reasonable that attention would be captured by distractors appearing at locations that observers monitor for targets. In this sense, the present study represents the first rigorous examination of spatial precision in the maintenance of attentional sets when splitting is required

Second, the present findings of set-specific capture (Experiments 5 and 7) highlight an aspect of attentional focus that is assumed to be involved during search involving multiple features (e.g., red and green). Specifically, Moore and Weissman (2010, 2011, 2014) argued that set-specific capture is triggered by a distractor of the same colour (e.g., red) as the target. The distractor results in the corresponding attentional set (e.g., targeting red items, rather than targeting oddballs) to enter a limited-capacity focus of attention in working memory (Jonides et al., 2008; Oberauer, 2002). They suggest that the set is briefly maintained, resulting in poor identification of a differently coloured (i.e., green) item because one of the valid attentional sets (i.e., targeting green items) cannot enter the focus of attention. Hence, processing is easier when the colour of the subsequent target matches that of the set in focus. Our results suggest that the entry of an attentional set into the focus of attention is not entirely automatic but is modulated by top-down control. If entry were automatic, then target identification should have been facilitated by a same-colour distractor preceding the target in the singleton-detection stream. Given that the apparent benefit of exposure to the same-colour distractor was demonstrated to be spurious by the lower accuracy obtained under the different-colour condition, reflecting a feature bias in favour of red items (see the inset analysis of Experiment 6, Figure 7), we have no clear evidence of a benefit arising from samecolour distractors. The elimination of the samecolour distractors advantage upon a reduction in the bias favouring red targets (Experiment 5) is also consistent with the idea that the entry of an attentional set into the focus of attention is modulated by topdown knowledge. This aspect of attentional focus has not been explicitly addressed in previous studies (Moore & Weissman, 2010, 2011, 2014) and is illuminated by the results of the present study.

Obviously, the present results do not indicate an overriding of one of the search modes by the other. If observers had relied exclusively on the featuresearch mode, accuracy would have been unimpaired under the different-colour distractor condition relative to under the control condition for both streams. If the singleton-detection mode was used exclusively, accuracy under the same-colour condition would have been lowest for both streams. However, neither of these patterns was observed. Of course these results do not exclude the possibility that the singleton detection mode was used with partial facilitation (e.g., Moore & Weissman, 2010). It is also possible that observers may have switched between strategies on a trial-by-trial basis. In that case, however, we would expect a consistent pattern of singleton detection for one stream and a consistent pattern of feature search for the other stream, although overall accuracy would have been low for both search types because observers would miss the target when it appeared in the unattended stream. This prediction is inconsistent with the present results.

To conclude, the present results highlight the flexibility, as well as the limitations, of the attentional sets used to monitor for the appearance of targets presented among multiple, sequential non-target items. Previous studies have primarily focused on whether two feature-based attentional sets can be concurrently established, whereas the present study was unique in addressing whether two different attentional control settings can be concurrently maintained. In other words, the central issue addressed by previous studies was the assignment of multiple features to multiple locations using the featuresearch mode. The present study extended the domain of investigation beyond the scope of the feature-search mode by testing for the possibility of combining search modes, as well as examining the limits of multiple feature-search strategies. The visual system was found to be flexible enough to maintain attentional sets when observers detected two singletons at different locations. However, the results indicate that the observers were unable to apply the singleton-detection and the feature-search modes concurrently in the same visual display. The system was not capable of maintaining a mixture of singleton-detection and feature-search modes at different locations, as shown by the disruption of a clear pattern in the singleton-detection stream. We found set-specific capture (Ito & Kawahara, 2016; Moore & Weissman, 2010, 2011, 2014; Roper & Vecera, 2012) occurring in both singleton-detection and featuresearch streams. The finding that the presence or absence of set-specific capture in the feature-search stream depends on the trial composition of distractor colours suggests that the entry of an attentional set into the focus of attention is not entirely automatic but is modulated by top-down control.

Article 19: Local spatial distortion caused by simple geometrical figures

Methods

Five participants (2 female; average age 26 years and 5 months) took part in Experiment 1. Two participants had corrected-to-normal vision.

A stimulus display consisting of a pair of identical horizontally oriented black-filled equilateral triangles was presented against a white background with stimuli centred with the reference to the monitor screen (see Figure 4). The area of each triangle was 173 mm2 (side = 20 mm, height = 17.3 mm), with eight equidistant increments from 4 mm to 32 mm between triangles. This led the shortest display to subtend a horizontal visual angle of 3°, and the longest, 5°12′ , from a viewing distance of 80 cm. The vertical visual angle was approximately 1°24′ . The average luminance of the background was 0.0359 cd cm–2 , and the value for the stimulus was 0.00002 cd cm–2 . The experiment was controlled by Superlab experimental software. Experiment 1 and all subsequent experiments were run from a Dell Latitude notebook connected to a 19-inch Mitsubishi Diamond Plus 91 monitor. The horizontal length of the monitor was 341 mm, and the maximum length of the stimulus in Experiment 1 was 66.6 mm, or under 20% of the overall length. The length of the unused space on each side was 137 mm—over twice the length of the stimulus.

The order of presentation was randomized in advance within four 24-trial blocks using random number tables. There were two levels of aspect (vertex, base) and eight levels of distance (4 to 32 mm), resulting in 16 conditions.

Participants were tested in a sound-attenuated room, with constant low-level ambient illumination provided by a ceiling light. The participants were shown an example of an experimental display (minimum and maximum distance) and were instructed to estimate verbally the distance between the two triangles using the category scaling method, which produces reliable subjective judgment functions (Stevens, 1975, p. 146). Participants were shown examples of the minimum and maximum distance in both configurations (bases and vertices) for 2 s each and instructed as follows:

Discussion

The observed differences in judgments are stable if subtle. In Experiment 1, the space bounded by two vertices was perceived as being roughly 10% longer than the same space in the side condition at the physical distance of 32 mm. The difference was smaller in Experiments 2, 3, and 4. Importantly, the difference decreased in line with the increasingly stricter constraints, adding further support to our hypothesis. To illustrate, the difference caused by the change in aspect of a single equilateral triangle (Experiments 2 and 3) was about 5%—about half the difference observed in Experiment 1. The difference was even smaller in Experiment 4 due to change in the physical properties of the stimulus. Yet the pattern of effects is consistent and reliable, and, as such, we believe it is worthy of further investigation. It should also be noted that the effects of local distortion were observed in judgment variability scores. Generally, the most salient effect was the inverse U profile, consistent with the increase in uncertainty halfway between the figure and the centre. Although no conclusions could be reached without further testing, the finding suggests that a parametric model of visual space must provide a thorough account of the effects of spatial distortion on response variability.

Our results are consistent with Watson’s (1978) proposal that visual space can be locally non-Euclidean. Watson proposed that the geometry of visual space changes locally depending on the relationship between the objects that occupy it. He hypothesized that lines and curves in visual space introduce a “force field”, which distorts perceived geometrical relations with regard to the Euclidean geometry. He contrasted two approaches to this “force-field” theory. The first assumes that perceptual distortions affect objects but not the underlying visual space, which remains Euclidean (p. 142). Second, and following the failure of this model to account for visual illusions, Watson suggested that objects themselves affect the basic geometry of visual space, resulting in changes in distance between objects or lines. Using the assumptions of Riemannian geometry, he demonstrated that some well-known visual illusions (e.g. Müller-Lyer and Poggendorff illusions) can be explained by treating visual space as a smooth elastic manifold, which is distorted by stimuli. In this differential-geometric framework, the effects of spatial distortion decrease with the distance from a line or figure, and contractions in one portion of the field must be compensated by expansion in another (p. 146).

In this context, our results may reflect dynamic interactions, producing a gradient landscape that is not directly perceivable but has permanent and stable effects on perception (e.g. Aksentijevic, Elliott, & Barber, 2001). This landscape consists of attractors (troughs or basins), flat regions, and transition regions (hyperbolic paraboloids or saddles) that are created by two figures when these are sufficiently close. Critically, the configuration of the landscape changes dynamically with the change in size, relative position, and number of objects. The degree of distortion created by a figure depends on its size and shape. Larger figures affect more of the surrounding space, and different features contribute differently to the local differences in distortion. These two factors interact to produce different grouping solutions.

In conclusion, we report four experiments that demonstrate for the first time the effects of spatial distortions created by simple geometrical figures (triangles and ellipses) on distance judgments. Our findings indicate that different aspects of a figure create different local gradients in the surrounding space. They support the idea that, at least in two dimensions, visual space is locally nonlinear and that its extrinsic geometry (Fernandez & Farell, 2009) is affected by the mass and shape of figures embedded in it. Future research will investigate the interaction between mass and shape, effects of saddle asymmetries imposed by non-identical figures, as well the effects of spatial distortions on the propagation of attention. Incidentally, there is evidence that the distortions in a number of illusions (Zöllner, Poggendorff, and Müller-Lyer) critically depend on the presence of corner junctions (e.g. Day, 2006) and that errors on a Müller-Lyer shaft bisection task increase close to the angles (Prebedon, 2000). Thus, one of the future directions of this research will be to systematically relate the strength of this illusion to the degree of field distortion.

Article 20: Adherence to hydroxyurea, health-related quality of life domains, and patients’ perceptions of sickle cell disease and hydroxyurea: a cross-sectional study in adolescents and young adults

Methods

We conducted a cross-sectional study using nonprobability convenience sampling methodology. We approached AYA who were 12–22 years old, had SCD patients (all genotypes), were English-speaking and on a steady state dose of hydroxyurea, defined as a stable dose for 2 months or more prior to enrollment in the study. Between January 2015 and December 2015, patients were enrolled before or after their scheduled outpatient comprehensive sickle cell clinic or hydroxyurea clinic appointments. Exclusion criteria included patients with SCD on chronic transfusion support, with any haemoglobin disorder other than SCD, or with any cognitive or physical disability.

We evaluated patients’ perceptions using the brief illness perception questionnaire (B-IPQ), which was adapted to reflect hydroxyurea and SCD [28]. In the adapted B-IPQ, we replaced the word “illness” by “sickle cell disease” and the word “treatment” by “Hydroxyurea”. For example, one of the questions was “How much do you think your hydroxyurea can help your sickle cell disease?” instead of “How much do you think your treatment can help your illness?” In addition, two items were deemed not applicable and/or could be confusing for patients with SCD, and therefore were deleted in the adapted B-IPQ version. The B-IPQ has been extensively utilized in earlier studies and used in patients as young as 8 years of age [27, 28]. The adapted B-IPQ consists of 7 items or dimensions including perceived consequences of SCD, personal control of SCD, control of SCD with hydroxyurea, identity (i.e. SCDrelated symptoms), concerns about SCD, understanding of SCD, and emotional response secondary to having SCD. The “Identity” domain will be referred to as “symptoms” throughout the manuscript. Each item uses a scale from 0 to 10 to assess each dimension, and each item is evaluated as a separate subscale. Higher scores indicate stronger perceptions of each dimension of the B-IPQ. In particular, higher B-IPQ scores indicate more negative perceptions of SCD-related consequences, identity (i.e. more perceived symptoms), concerns, and emotional response, but more positive perceptions of personal control, treatment control, and understanding of SCD.

Study participants were asked to complete Patient Reported Outcomes Measurement Information System – Computerized Adaptive Testing (PROMIS®-CAT) measures using an electronic tablet [29]. PROMIS-CAT is a novel application of a comprehensive, item-response theory optimized item bank, which enables precise estimation of a PRO domain while simultaneously minimizing burden to participants [30, 31]. In CAT, items administered are selected based on informant’s previous item responses, using a pre-set computerized algorithm based on individual item information functions. Therefore, the total number of items used in different PROMIS measures vary within and in-between patients. A number of PROMIS® measures have been validated in the paediatric and adult populations [32–35], and have been recently evaluated in SCD [36, 37]. Adolescents (age 12–17 years) were asked to complete paediatric PROMIS®-CAT measures of fatigue, pain interference, physical functioning mobility and upper-extremity, depression, anxiety, and peer relationships. Young adults (age 18–22 years) were asked to complete adult PROMIS®-CAT measures of fatigue, pain interference, physical functioning mobility and upper-extremity, depression, anxiety, and social isolation. PROMIS peer relationships and social isolation measures have different set of questions, however both evaluate patients’ relationships and social support. All paediatric and most adult PROMIS®- CAT measures elicited participants’ responses based on the previous 7 days using 5-point response options ranging from “with no trouble” to “not able to do” for physical functioning measures and from “never” to “almost always” in all other measures. No timeframe was assigned to adult PROMIS physical functioning measure. Higher PROMIS® domain scores indicated better physical functioning (mobility or upper-extremity), and peer relationships, but worse severity for fatigue, pain interference, depression, anxiety, and social isolation. PROMIS®-CAT paediatric and adult measures were scored on a general population based T-score metric with a mean of 50 and a standard deviation of 10 [32, 38].

Hydroxyurea adherence was evaluated using the ©Modified Morisky Adherence Scale 8-items (©MMAS-8), which was adapted to reflect hydroxyurea and SCD. In the adapted ©MMAS-8, we replaced the words “medicine”, “medication” and “pills” with “Hydroxyurea”. ©MMAS-8 includes 7 yes/no questions and 1 multiple choice question, and evaluates adherence over the past day and 2 weeks [39, 40]. Total ©MMAS-8 numerical scores were calculated per the assessment manual. Higher ©MMAS-8 scores indicated better adherence to hydroxyurea. Based on the total ©MMAS-8 score, three levels of adherence were also considered: low (0 to <6), medium (6 to <8) and high (8).

Discussion

Early reports have shown a relationship between patient and parental acceptance of hydroxyurea and their perceptions of SCD severity [20, 24–26], which may indirectly influence hydroxyurea adherence. Parents who perceived their children as having a milder form of SCD were less willing to accept the risk of hydroxyurea side effects, particularly in relation to birth defects and cancer risk [20, 24–26]. In contrast, parents of patients with severe SCD sought more information about hydroxyurea and were more accepting of its use as a preventive strategy [24, 25]. Different factors have been proposed to contribute to the decision of starting hydroxyurea in patients with SCD, including patients’ and parental perceptions. In a single-institution study, the majority of parents and patients were in favor of using hydroxyurea, which was perceived as safe and effective with balanced risks and benefits, compared to chronic transfusions and stem cell transplantation [49]. In our study, greater hydroxyurea adherence by patient self-report and higher MCV and HbF levels was associated with perceptions of greater treatment benefit from hydroxyurea, although the direction of any cause and effect relationship is not clear.

We also sought to examine patients’ perceptions of SCD and hydroxyurea in relation to their domains of HRQOL. Similar to children with other chronic conditions, children with SCD have poor HRQOL domain scores [3, 34, 36, 50]. In our cohort, patients’ perceptions correlated with different HRQOL domain scores. Patients with more negative perceptions of SCD-related consequences, concerns, and emotional response, or with less perceived benefits of hydroxyurea, reported worse fatigue, pain, anxiety, and depression scores. These relationships suggest an association between worse perceptions of SCD and/or hydroxyurea, and poor HRQOL domain scores. Nevertheless, given the nature of our cross-sectional study, we cannot determine the direction of the relationship, namely whether poor HRQOL leads to worse perceptions or that worse perceptions leads to poor HRQOL domain scores. Consistent with our results, O’Donovan et al. have shown that, in a cohort of patients with congenital heart disease, illness perceptions were also predictive of different HRQOL domains and psychological outcomes, including depression and anxiety [51].

Some limitations of our study warrant discussion. First, our study was at a single institution and data were collected from a convenience sample of SCD patients, which could limit the generalizability of our results. However, our study helped to generate further hypotheses that could inform a larger prospective study. Second, the cross-sectional design of the study limited our ability to examine the changes in patients’ perceptions, hydroxyurea adherence, and different domains of HRQOL over time. Third, we limited our study population to AYA population with a relatively narrow age range (12–22 years old). However, we focused on AYA because they represent a specific age group when patients start to take responsibility of their illness and be in charge of taking their hydroxyurea on their own, which make them at higher risk for low hydroxyurea adherence. Fourth, we evaluated SCD-related events (e.g. ED visits and hospitalizations) at our institution only and it is possible that SCD-related events elsewhere could have been missed. Finally, we used B-IPQ and ©MMAS-8 to evaluate patients’ perceptions of SCD and hydroxyurea adherence, respectively, and both have not been validated for adolescents or in SCD. To address this, we conducted pre-testing to ensure participants’ comprehension of different items of the B-IPQ and ©MMAS-8. Both measures have been used in published studies that included patients with SCD and/or other chronic conditions [14, 27, 47, 52–54], and in particular, the B-IPQ has been used in studies with patients as young as 8 years of age [27]. In addition, objective laboratory data supported patients’ perceptions and adherence levels by self-report using B-IPQ and ©MMAS-8.

Perceptions of disease and treatment amongst AYA with SCD correlated with subjective and objective adherence measures, HRQOL domain scores and number of hospitalizations. Our findings enhance our understanding of patients’ perceptions of SCD and hydroxyurea and suggest that hydroxyurea adherence is a multifactorial process. Understanding patients’ perspectives could support efforts to overcome adherence and utilization barriers. [55, 56] Given the fact that hydroxyurea adherence is a dynamic and multi-factorial process, changes in patients’ perceptions of hydroxyurea and how it helps them maintain control of their illness could serve as surrogate markers for early changes in hydroxyurea adherence over time. Therefore, our results suggest that a longitudinal prospective assessment of patients’ perceptions may reveal modifiable factors associated with early changes in hydroxyurea adherence and HRQOL over time. Routine assessment of patients’ perceptions of hydroxyurea and SCD, adherence to hydroxyurea, and HRQOL in SCD outpatient settings should be considered using different platforms. Given the wide access to technology [21, 57, 58], web- or mobile-based platforms could be utilized to allow the completion of different assessments more frequently, and in-person or remotely in different settings.

Article 21: Adjusting to the Receiving Country Outside the Sport Environment: A Composite Vignette of Canadian Immigrant Amateur Elite Athlete Acculturation

Methods

After receiving university Institutional Research Ethics Board approval, the authors used their connections with various national sport associations and national sport centers to gain a list of potential immigrant athletes who would be suited to the study and extend an initial recruitment invitation for the athletes to participate. This recruitment process was initiated through posted invitations to participate by Skype, with follow-up e-mails sent to the coaching fraternity of nationally accredited coaches and to executive directors from national sport organizations. When a positive response was received from immigrant athletes by their coaches, the athletes’ contact information was forwarded to the first author. Either the first or second author then followed up with the athletes to provide information about the project.

Participants were 24 national- and international-level athletes who had immigrated to Canada during their teenage years and early adulthood. At the time of the interviews, the participants had been living in Canada for an average of 8.6 years. The participants relocated to Canada for nonsport reasons, though all but two were recognized athletes within their home countries before relocation. Hence, these athletes embarked on their acculturation processes during adolescence and continued onward in this process into adulthood. Eighteen of the participants were male, and six were female. At the time of the study the athletes ranged in age from 18 to 32 years (M = 23 years). Participants came from 10 sports: boxing (n = 6), swimming (n = 5), badminton (n = 2), judo (n = 2), karate (n = 2), basketball (n = 2), rugby (n = 2), soccer (n = 1), racquetball (n = 1), and bobsleigh (n = 1). They immigrated to Canada from 20 countries, divided by continents as follows: North America (n = 2), South America (n = 1), Europe (n = 10), Asia (n = 7), Australia (n = 1), and Africa (n = 3).

Given that the participants were geographically dispersed across Canada, the second author met with each individual and conducted data collection over Skype, whereby face-to-face contact was enabled remotely. This particular approach to data collection has recently been termed “computer-mediated interviewing” (see Sparkes & Smith, 2014). A synchronous approach was utilized whereby both researcher and participant used the Internet at the same time (i.e., they meet on the Internet). Sparkes and Smith proposed that Skype interviewing, one form of synchronous interviewing, has various advantages over in-person interviewing. Among these, it is proposed that when the participants and researchers are not sitting physically in the same room, participants might feel comfortable to disclose information that they would have retained had the interview been in person. As well, the use of Skype permitted the researchers to interview audio athletes from across Canada and those training abroad through a medium where physical distance could be overcome.

To begin eliciting stories the participants created drawings that reflected their experiences as immigrant athletes in Canada. The participants were given the choice to create their images in the form of a circle (known as a mandala; see Blodgett et al., 2013), as a flowing river, in the form of a tree, or as a freehand image. Arts-based methods had been used extensively in the coauthors’ earlier projects. During these projects, in keeping with Coholic and LeBreton’s (2007) resilience research, the participants found these activities both enjoyable and conducive with self-disclosure. Within the current project, all of the participants were willing to engage in this activity and chose forms that resonated with them most. Once the participants had created their drawings, the images were used to facilitate conversational interviews. Many of the participants then shared that by connecting their drawings with their stories, they learned more about their own reflections as acculturating newcomer athletes. This unstructured and open-ended type of interviewing was selected for two key reasons. First, aligning with the aim of the present study and its narrative approach, the conversational approach invited rich storytelling. Participants were asked to reflect on their experiences holistically and open-endedly and were encouraged to bring forward narratives that could reveal multiple, intersecting layers of experience. This approach helped to “capture” the multifaceted nature of participants’ lives, rather than gloss over it (McGannon & Smith, 2015; Smith & Sparkes, 2009). Second, the conversational interview facilitated a participatory process (Blodgett & Schinke, 2015; Blodgett, Schinke, McGannon, & Coholic, 2014).

Discussion

Moving further into the vignette with “weighing the risks for the journey ahead,” complexity is layered into why it is that the athlete struggles playing out the role of “newcomer.” Blodgett et al. (2014) referred to this struggle as navigating the outsider–insider hyphen, wherein the athlete is never fully considered an insider or an outsider but is simply in a state of flux in between these positions. Within the previous, initial theme, the authors found the athlete referring to the earliest steps associated with acculturation—getting oneself rooted in schooling, a job, and in a physical locale, aspects commonly identified in acculturation scholarship (e.g., Schwartz et al., 2010; Steiner, 2009). With the vignette’s expansion in this theme, there is an overt focus on what is already recognized as a delicate topic—forging social relationships with peers (Berry, 1997). The athlete clearly wishes to belong among peers and yet finds that seeking this acceptance has become a series of trade-offs (Schinke et al., 2013). These tradeoffs include the beginnings of being ridiculed, first for not understanding what is being said and then later for the accent the athlete brings to social exchanges, when able to make oneself understood. These punishing formative experiences appear to deepen Ryba et al.’s (2012) findings in sport contexts where there is a lack of interest in relatedness or understanding on the part of those from the receiving country. There appears to be a taken-for-granted assumption that the dominant group need not engage in any form of acculturation and that when they do, these are unusual experiences. Cultural learning seems to be imposed on the newcomer in a manner that deepens feelings of loneliness and isolation (see Blodgett & Schinke, 2015; Schinke et al., 2013). We find in this theme that for the athlete to be accepted, there must first be tolerance that one is going to be laughed at and stung. Furthermore, there will be no acknowledgment by the receiving culture of the emotional and psychological repercussions for these athletes, deepening the divide and distrust between receivers and the newcomer and sustaining the tenuous moves form positive to negative (see Blodgett & Schinke, 2015). Should the athlete accept and open oneself to these assaults, new friendships can be forged at the expense of tolerating ridicule and being systematically emotionally injured (Ryba et al., 2012). The hope is to become closer with peers, but what sits in the balance is the athlete’s feelings of humiliation or anger of becoming the brunt of a standing joke, with open emotional sores (Schinke et al., 2006). The question then lingers: Will attempting to learn the language be a step toward forging friendships, or might it materialize into having the newcomer constantly navigating the borderland between outside and insider, contributing to emotional exhaustion?

The sport psychology consultant has an important role to play in supporting the newcomer in this frustrating process, ideally in strategies that foster engagement instead of avoidance. The consultant is clearly not able to help craft a welcoming environment throughout the day, because the environment under discussion is away from sport. However, the consultant can follow up with the newcomer and seek to understand what sorts of social connections are being forged and whether the athlete is being ridiculed. The consultant might also help structure a functional network for the athlete among peer athletes to ensure that acceptance, at least within the sport environment, is adaptive and sensitized to the challenges posed by being a newcomer when away from sport. The aforementioned aspects place the onus of acculturating on the newcomer, and it should be recognized that acculturation is a highly interactive/social process. In addition to the direct work undertaken with the athlete, the practitioner might also reflexively examine where she or he might be contributing to feelings of alienation on the part of the athlete (McGannon & Johnson, 2009; Schinke et al., 2012). Some critical reflections should also be undertaken by consultants, by placing themselves in the shoes of newcomers with whom they work with and asking, “How would I feel if I were in a similar new situation, where layers of unfamiliarity are being encountered all at once?” The consultant might also consider, “How would I want to be approached and supported if I were the newcomer?” This shifting spotlight onto the sport psychologist would permit critical introspection, leading to sensitized understandings of what the newcomer might be undergoing away from sport.

The story then continues in the final theme, “Public Stonings,” with the athlete opening up a much deeper analysis of the pain associated with what it is like to acculturate. The athlete describes the initial shock of having to come up to speed with unfamiliar cultural practices and ways of doing things quickly upon landing in the receiving country, akin to what has been referred to as culture shock (Blodgett et al., 2014). In relation to experiencing culture shock, the vignette now exemplifies facets that the athlete associates with being overloaded with new information and practices to make sense of as part of second culture learning (see Rudmin, 2009) and why overloading happens, leading to the metaphor of being pelted by rocks, and all that it is associated with (e.g., ridicule, emotional pain). There are many commonly found aspects that need attending to, each its own rock, such as managing educational needs, struggling through new tastes and unfamiliar food, and living in a new location (see also Bowskill et al., 2007). While the athlete is experiencing these unfamiliar aspects of the receiving country and locale (see also Schinke et al., 2007), there are no supportive social connections to draw upon as guides, or as refuge, to help smooth the transition. These uncharted experiences are akin to what Schinke et al. (2013) referred to as shouldered acculturation (see also Bowskill et al., 2007). When there are no guides to link up with to help mentor the newcomer, much of the learning is gained firsthand. These attempts seem nerve-racking with many painful missteps, the first ones albeit tentative, that leave the athlete exposed and humiliated, similar to Tanaka’s (2014) professional rugby players, Meisterjahn and Wrisberg’s (2013) professional basketball players, or Schinke et al.’s (2011) boxers. In relation to these early catalysts, the sport psychology consultant can serve as someone who listens and seeks to understand how it is that the newcomer athlete feels overwhelmed when away from the training environment. The consultant can also serve as an initial contact person and social connector for the newcomer, linking the athlete to pertinent resources and community groups. This offering might continue, with the support of the coaching staff, until the athlete develops a social network of peers. Once peer relationships are formed, these people might begin to help mentor and support athletes toward settlement. Undertaking this broader support might avert athletes, such as the minor league baseball players Kontos (2009) identified, withdrawing from the receiving culture, underachieving in sport, and becoming underutilized and eventually deselected.

Within this project, a focus was placed on life outside of sport for national and international amateur athletes who became citizens in an unfamiliar receiving country. The vignette, comprising three themes, reveals layers of uncertainty that seem to serve as barriers to healthy social relationships outside of the sport environment. These uncertainties include, on one hand, recognition of the possibilities the unfamiliar country might offer and, in the balance, tenuous challenges that might impede the acculturation process. Although no clear solutions can be brought forth from a single project in relation to how any newcomer might navigate acculturation challenges outside of the sport environment, there is evidence that this part of the acculturation process (i.e., the nonsport experiences) is extremely delicate, highly social, and possibly damaging to the newcomer. Although solutions regarding how to effectively acculturate are not easily determined, it does become clearer that the role of the sport psychology consultant in relation to this process necessitates a holistic approach to practice, working with the whole person, in relation to nonsport life. Conversely, focusing exclusively on the sport context would be to ignore a sizeable part of the newcomer’s life during these moments of vulnerability.

Article 22: Research on Medical Practices: Why Patients Consider Participating and the Investigational Misconception

Methods

We conducted a cross-sectional, web-based survey of 1095 adults in the United States in August 2014. Research Now12 provided the sample from a combination of online research panel members (n = 805) and a convenience river sample of Internet users (individuals who were invited to participate when they visited general, social media, and loyalty websites) (n = 290). The survey included brief embedded animated videos, developed by the study team along with Booster Shot Media,13 to explain basic concepts about ROMP. The animated videos posed an example of doctors wanting to compare three effective and commonly prescribed antihypertensive medications to discover which is best. The first video conveyed that different doctors might treat the same patient with different medications. The second video described two research methods—randomization and medical record review—that could be used to compare the medications. After viewing the videos, respondents answered survey questions about their attitudes about ROMP. The videos were iteratively refined by the study team, with input from patient focus groups. We designed the survey questions based on a series of focus groups in which we qualitatively assessed patients’ views about ROMP,14 and we refined the survey using a series of cognitive interviews with members of the public to ensure that the questions were clearly written. The videos and survey instrument are available on the ROMP Ethics Study website.15 Further details about survey development and administration are described elsewhere.16 The University of Washington and Stanford University institutional review boards approved this study.

After respondents had viewed the videos, the survey presented three hypothetical examples of ROMP: a medical record review study of antihypertensive medications, a randomized study of antihypertensive medications, and a randomized study of medications for a “more serious condition” described as causing an increased risk of stroke. Each scenario was followed by a question asking respondents whether they would be willing to consider participating in the study described. For the first and second scenarios, we also asked respondents to imagine that they were the medical decision-maker for a family member and to state whether they would be willing to consider giving permission for their family member to participate in the study. For the questions about randomized studies of hypertension when the patient is oneself, hypertension when the patient is a family member, and a more serious condition when the patient is oneself, we offered respondents the opportunity to write an open-ended response about why they would or would not consider participating. Table 1 shows the wording of each scenario and the subsequent questions (all tables for this article are available through the IRB: Ethics & Human Research web page). We limited open-ended responses to these three scenarios to minimize the burden on survey respondents. We also asked a series of standard demographic questions at the end of the survey

One author (DMK) preliminarily reviewed and cleaned all the open-ended responses, removing nonresponsive or nonsensical responses. A total of 113 such responses were deleted from the hypertension-self scenario, 135 from the hypertension– family member scenario, and 154 from the more-serious-condition–self scenario. A subgroup of the authors (KMP, DMK, MC, and CJ) used a conventional content analysis approach17 to inductively develop a codebook based on initial review of respondents’ open-ended answers, which the entire study team iteratively reviewed and revised. Two coders (SAK and KMP) subsequently underwent a training process wherein they applied the codebook to a subset of respondent answers, stratified by question and by response of willing or unwilling, and made additional revisions to finalize the codebook (see the Appendix, available through the IRB: Ethics & Human Research web page). The two coders then each independently coded half of the respondent answers, stratified proportionally based on question and response. Inter-rater reliability was calculated on 20% of all respondent answers, resulting in a Cohen’s kappa of 0.84. Coding, inter-rater reliability testing, and calculation of kappa were done using Dedoose qualitative software.18 Basic descriptive statistics were calculated using Microsoft Excel.

Discussion

The most pervasive misunderstanding we found, which we term the “investigational misconception,” was that all research involves testing a new, nonvalidated intervention, whereas the actual goal of ROMP is to compare existing, approved interventions and fill gaps in medical knowledge about their relative effects with different groups of patients. The investigational misconception, which has not been previously described, manifested in different ways: some respondents said they would participate because they believed it was their only chance to get a new and beneficial medication, while others declined because they did not want to risk receiving a placebo or an untested medication. As ROMP becomes increasingly common, the investigational misconception is ethically problematic because it could result in both over- and under enrollment. Some patients might consider enrolling in ROMP because they believe it is the only way to receive a standard treatment. Other patients might not consider enrolling because of an unfounded fear of receiving a placebo or an investigational intervention, in spite of the fact that ROMP includes neither. To avoid these unwanted outcomes, efforts to improve informed consent for ROMP—such as pragmatic clinical trials of multimedia consent tools, which have begun to show promise for overcoming this misconception25—are needed. In addition, alternative study designs and approaches to notification should be considered and assessed to see if they may also help minimize misconceptions.

However, it is important to acknowledge that even significant efforts to improve prospective participants’ understanding of ROMP may fail to address all possible misunderstandings.26 Notably, the misconceptions we highlighted in this study were among the issues that our animated videos were designed to explain. It is clear that more work is needed to improve the efficacy of future educational tools, at least to the extent that these issues are necessary for prospective participants to understand. In addition, we also conducted follow-up interviews with a limited number of survey respondents for the purpose of improving future surveys; while we did not systematically analyze the interview data, those interviews suggested that at least some respondents continued to have misconceptions even after lengthy discussion. Thus, providing thorough education about all aspects of ROMP will likely be an ongoing challenge. Further research is needed to better understand the prevalence and persistence of the investigational misconception and other misunderstandings about ROMP, as well as what steps investigators can take to minimize their effects on enrollment decisions.

This study has two main limitations. First, the open ended questions were designed to allow survey respondents to submit brief comments and thus did not allow for expanded discussion or clarification. Subsequent qualitative work could continue to explore the themes identified in this study. Second, our survey presented hypothetical scenarios rather than actual enrollment decisions. Because this was an exploratory study and not embedded in an actual trial, the scenarios lacked some contextual information that would likely inform enrollment decisions. The specificity of the scenarios also limits our findings’ applicability to other types of research that could fall within a broader definition of ROMP or comparative effectiveness research. Therefore, we offer our findings as an overview of the range of factors patients consider, not as a definitive accounting of their decision-making process for a particular study. Further study is needed in the context of ongoing pragmatic clinical trials to assess participants’ actual, rather than hypothetical, reasons for participating.

Despite these limitations, this exploratory study is strengthened by the large number of respondents and the use of open-ended questions, which allowed us to identify respondents’ top priorities related to participation in ROMP in their own words and to describe the range of ROMP-specific reasons, concerns, and misconceptions related to study participation. This study provides insight into the important question of why people are or are not willing to consider participating in ROMP and offers a starting point for future research. Moreover, the investigational misconception may present an obstacle to recruitment and informed decision-making by patients invited to participate in ROMP; overcoming this fundamental misunderstanding of the nature of ROMP is a critical issue for future research.

Article 23: Sexting Behaviors and Cyber Pornography Addiction Among Adolescents: the Moderating Role of Alcohol Consumption

Methods

The participants were 610 adolescents aged 13 to 20 years (Mage = 16.8; SDage = 1.63; 385 females, 63.1 %). Data were collected by a paper and pencil questionnaire. Participants were recruited from Italian public schools and universities. Written informed consent was obtained by parents on behalf of minor participants. Adult participants were asked to provide a written consent to participate to the study. The majority of participants lived with both parents (78.9 %), or with only one parent (14 %). The parents’ educational levels were as follows: 34.7 % of fathers and 28.4 % of mothers had a middle school degree, 44.7 % of fathers and 51.4 % of mothers had a high school degree, and 20.4 % of fathers and 20.3 % of mothers had a university degree or post-university education. This study and its procedure for data collection were approved by the Ethics Committee of the Department of Dynamic and Clinical Psychology of Sapienza University of Rome.

The participants were initially asked about some personal data, as well as family composition and further information about socio demographics

Sexting behaviors were assessed through the Sexting Behaviors Questionnaire (SBQ; Morelli et al. 2016b), an instrument inspired by the Sexting Behaviors Scale (Dir 2012). The scale was composed of 29 items that evaluated the frequency of different sexting behaviors on a five-point Likert scale, from 1 (never) to 5 (frequently or daily). Sexting was defined as the exchange of provocative or sexually suggestive messages, pictures, or videos via smartphone, Internet, or social networks (a sample item is BHow often have you received provocative or sexually suggestive pictures, messages or videos over the Internet (i.e., Facebook, e-mail, Myspace)?^). The strength of this scale is the deeper assessment of the three subdimensions of sexting: receiving, sending, and publicly posting. For a more detailed description of the scale, see Morelli et al. (2016b). The scale reached a Cronbach alpha of 0.92. The three subdimensions showed good reliability as well: the receiving subscale exhibited a Cronbach alpha of 0.85, with the sending subscale showing 0.84 and the posting subscale showing 0.94.

Alcohol consumption was assessed with the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al. 2001). This scale was developed by the World Health Organization to evaluate alcohol-related problems and the possible risk for individual health. The scale assesses the amount and frequency of drinking, the alcohol addiction, and the problems related to alcohol abuse. In our scale, the participants had to rate eight items on a five-point scale, ranging from 0 (never) to 4 (frequently or daily). A total score for alcohol consumption based on these items was used in this study. In this sample, the scale reached a Cronbach alpha of 0.76.

Discussion

As we hypothesized, gender differences were found for the three sexting subdimensions (i.e., receiving, sending, and posting sexts): Males were more likely to send, receive, and post sexts. These results may be explained by referring to the Italian cultural context. Previous studies found that Italian male adolescents are more likely than females to report that they find erotic materials enjoyable and arousing, and reported stronger positive expectancies about receiving sexts (Eurispes & Telefono Azzurro 2012).

Consistent with previous studies exploring the correlations between risky behaviors and sexting (Dir et al. 2013a), our study provided information pertaining to the relationships between cyber pornography addiction, alcohol consumption, and sexting. Nevertheless, results from the moderation analysis suggested that the relationship between cyber pornography addiction and sexting is stronger in those who have a high alcohol consumption. Conversely, alcohol restraint could represent a protective factor against engaging in sexting even in the presence of high cyber pornography addiction. Therefore, we suggest that the tendency to reenact the contents viewed in cyber pornography sites appear to be facilitated by the disinhibition effect of alcohol consumption. To our knowledge, this hypothesis was never been tested before and is in need of support among different age groups and cultural contexts. However, our results suggest that cyber pornography is not a predictor of sexting per se, because its relationship with sexting becomes weak in those who have a lower alcohol consumption. Thus, these results could be explained by the presence of a factor underlying all assessed dimensions (i.e., cyber pornography, alcohol, and sexting): as suggested by Krueger et al. (2005), there could be a common ethiological pattern for externalizing behaviors that involves both antisocial behaviors, substance use, and personality traits. Future research should investigate the relationship between cyber pornography and sexting in line with this perspective. Furthermore, our study may have research implications beyond clinical implications. Results could shed light on how to investigate sexting predictors and suggest that researchers should be careful in studying sexting antecedents. There seem to be other possible factors that condition (moderate) the relationship between these antecedents and sexting. In fact, the literature had shown inconsistent results regarding the link between cyber pornography and sexting (Crimmins and Seigfried-Spellar 2014; Vandenbosch et al. 2015; Van Ouytsel et al. 2014). To our knowledge, this is one of the first studies that investigated not only the linear relationships but also the interaction effects between the antecedents of sexting. This could also help to precisely identify factors that lead to sexting and to project more effective prevention programs.

There were important limitations to our study. First, we used a convenience sample and we did not consider how social class or ethnicity might interrelate with sexting behaviors. Second, the study was conducted in Italy, and these findings may not apply to adolescents living in other countries. Third, there was a possible effect of social desirability, as there always is when data are collected using self-report questionnaires. Additionally, using qualitative methods to further analyze the ways in which sexting behavior is placed in a context of adolescent impulsivity, sensation seeking, and problematic alcohol and drug abuse would also be of interest. Moreover, it would be useful to study the direct and indirect effects of sexting on adolescents’ development and provide suggestions for future policies and research.

Even if sexting could be considered a normal expression of sexuality among adolescents (Dake et al. 2012; Levine 2013), some characteristics of sexting—such as the mass dissemination of explicit images, cyberbullying, social humiliation, psychological distress, and legal issues—require significant preventive interventions through law enforcement and education for adolescents, parents, and educators, as previously suggested by Martinez-Prather and Vandiver (2014). In particular, it is critical to understand the beliefs, attitudes, and risky behaviors associated with sexting and, consequently, to provide adequate sexual education to adolescents. In Italy, negative attitudes toward sexual education persist; hence, prevention programs should be developed to deconstruct stereotypes regarding sexuality during adolescence. It is our hope that this paper will contribute to the scientific understanding and promotion of psychological well-being for adolescents.

Article 24: An In Vivo Study of Self-Regulated Study Sequencing in Introductory Psychology Courses

Methods

All experimental protocols and consent materials were approved as an Exempt Study by the Indiana University Institutional Review Board. Instructors volunteered to include the study intervention as part of their Introductory Psychology curriculum, and all students of participating sections completed all the study procedures because they were part of the normal instructional activities of the class. A statement about this study was included in the syllabus of participating sections. Participant’s consent to have their data analyzed and included in this study was obtained from all students in compliance with the IRB of Indiana University. Parental consent for this study was waived by the IRB of Indiana University for students under the age of 18 enrolled in the class, because this activity was part of their curricular activities (and was specified as such on the syllabus), and a parent or guardian of any minor would have already consented to their participation in the course.

A total of 2061 (Time 1: N = 678; Time 2: N = 1383) undergraduate students registered in one of the 18 sections of Introduction to Psychology at Indiana University participated in the study as part of their normal class activities and agreed to have their study data and grades included in the analyses for this study. The instructors of the participating section agreed to include the tutorial as an extra-credit homework activity and the posttest questions as part of their first evaluation point. Instructors were unware of the manipulation introduced (except for one section whose instructor was the fourth author). Some instructors taught more than one section in the same or across data collection times.

Students access the tutorial through a website, which randomly assigned them to either the Self-Regulated (N = 1386) or Yoked (N = 657) groups (see details below). Neither the student or the instructor had any a priori knowledge of the condition. The final sample of 2061 students includes 1208 students who were matched to another student (i.e., 604 complete Self Regulated-Yoked dyads). The remaining students (N = 853) either did not have anybody paired with them or the student paired to them was not included in analyses due to not having consented or missing the exam.

Due to the nature of the research conducted and its inclusion as part of normal classroom activities, it was not possible to collect demographic information about the participating participants. However, to characterize the population we present demographic data for the population of students of Introductory Psychology at Indiana University Bloomington for the past 15 years in Table 1.

Discussion

Second, interleaved study requires students to keep active their knowledge of several procedures or concepts simultaneously, which might result in greater cognitive load [49–52] and change their perceptions of mastery, negatively impacting their study decisions [53]. These potential drawbacks of interleaved study could have a more serious effect when compounded by the increased cognitive demands of self-regulated study described above. By contrast, in blocked study, the task is not as demanding on cognitive resources because students can focus on one concept at a time. Thus, self-regulated conditions could exacerbate a potential weakness of interleaved study. In sum, self-regulated study could mitigate problems associated with blocked study, aggravate problems associated with interleaved study, or both.

In recent years, there has been an increasing interest on how the sequence of study can affect learning [7–9,13,14,37,54] in no small part because students are increasingly in charge of organizing their own study, and may fail to adopt the optimal sequence of study [3] with potential negative consequences. In this context, we believe the current research raises two important points.

First, it is important to consider the possibility that apparently inefficient study decisions might be beneficial if the student is the one making them. Despite the large literature showing an advantage for interleaved study in inductive category learning, the present work points to possible advantages for blocked study. Importantly, the benefits of blocked study were only found when students actively chose it themselves rather than having it imposed on them. We believe more work is needed to investigate how the best sequence may depend on the study situation, and the importance of self-regulation in the context of studying decisions.

Secondly, from a methodological point of view, this experiment can serve as a model for carefully controlled research in naturalistic contexts and pedagogically relevant issues. The effect of self-regulation described here, albeit small, was found in the context of students’ real study experience, very different from the common laboratory study. Although this methodology might present lower measurement resolution (only four test questions) and increased measurement noise resulting in decreased power compared to the usual laboratory study, it has considerable ecological validity. Moreover, in contrast to many classroom studies, online distribution of the tutorial allowed considerable control over the intervention and precise recording of the students’ behavior for inclusion in subsequent analyses. We believe that similar in vivo yet individually-controlled studies of learning in educational contexts [41,55] represent a major potential growth area for cognitive science.

Article 25: The neurotic wandering mind: An individual differences investigation of neuroticism, mind-wandering, and executive control

Methods

Participants were 213 undergraduate students (128 females) at the University of Oregon with an average age of 19.40 years (SD = 2.32). Due to time limitations and computer errors, 201 participants had complete data on the working memory capacity and attention control tasks, mind-wandering probes, and personality questionnaire. All participants gave informed consent and were given course credit for participation. We collected data with the goal of reaching 200 participants to achieve adequate power for confirmatory factor analysis and structural equation modelling.

After giving informed consent, participants completed three measures of working memory capacity, three measures of attention control, and a personality questionnaire. All tasks were completed in a single laboratory session.

Operation span. Participants solved a series of maths operations while trying to remember a set of unrelated letters. Participants were required to solve a maths operation, and after solving the operation, they were presented with a letter for 1 s. Immediately after the letter was presented the next operation was presented. At recall participants were asked to recall letters from the current set in the correct order by clicking on the appropriate letters. For all of the span measures, items were scored correct if the item was recalled correctly from the current list. Participants were given practice on the operations and letter recall tasks only, as well as two practice lists of the complex, combined task. List length varied randomly from three to seven items, and there were two lists of each list length for a maximum possible score of 50. The score was total number of correctly recalled items

Participants recalled sequences of red squares within a matrix while performing a symmetry-judgment task. In the symmetry-judgment task, participants were shown an 8 × 8 matrix with some squares filled in black. Participants decided whether the design was symmetrical about its vertical axis. The pattern was symmetrical half of the time. Immediately after determining whether the pattern was symmetrical, participants were presented with a 4 × 4 matrix with one of the cells filled in red for 650 ms. At recall, participants recalled the sequence of red-square locations by clicking on the cells of an empty matrix. Participants were given practice on the symmetry-judgment and square recall task as well as two practice lists of the combined task. List length varied randomly from two to five items, and there were two lists of each list length for a maximum possible score of 28. We used the same scoring procedure as that used in the operation span task.

Discussion

As is the case with any study, the present investigation has several limitations. First, the present study uses a rather brief (eight-item) measure of neuroticism. A longer, more detailed measure that is designed to specifically measure neuroticism, or perhaps multiple measures with convergent validity, may be more appropriate for future studies on the relation between neuroticism, mind-wandering, and executive control. Second, the mind-wandering construct was drawn from rates of mind-wandering during the attention control tasks. In the future, these measurements can be combined with other indices of mind-wandering (e.g., diaries, experience sampling) to corroborate the findings of mind-wandering in the lab. Third, the present study does not measure other closely related aspects of neuroticism such as negative affect, mood, anxiety, and worry, nor does it ask participants to report any recent life events that may impact their cognitive performance and ability to resist mind-wandering beyond their personality traits. For example, if an individual recently experienced a personal crisis or has a stressful upcoming event in the near future, they may be more prone to mind-wandering about such an important personal event, which could be totally independent of their stable personality traits. Future work should measure both state (i.e., temporally specific) factors and trait factors that can contribute to the relationship between emotion and cognition. Finally, the tasks inherently carry a level of explicit and implicit feedback that may be unintentionally inducing test anxiety. This procedure-induced test anxiety could be affecting task performance, especially for those individuals high in neuroticism and thus more predisposed to experiencing anxious thoughts and feelings.

We should also note that a previous investigation by one of the authors (Unsworth et al., 2009) found a null correlation between neuroticism and one measure of working memory (operation span) and neuroticism and attention control/inhibition. There are several possible reasons for the discrepancies in these findings. The first is that the personality measurement in Unsworth et al. (2009) was the 280- item Revised NEO Personality Inventory (Costa & McCrae, 1992), and the present study used a 44-item Big Five Inventory. Although the measures of neuroticism in the two measures are moderately to highly correlated, they are not identical (Rammstedt & John, 2007). So it is possible that the subtle differences in these two measures can explain the discrepant findings. We acknowledged earlier that one element of the present study is the use of only one measure of neuroticism, so it is possible that these measures may be tapping slightly different aspects of neuroticism that have different relationships with mind-wandering and executive control. Another possibility is a difference in procedure. In Unsworth et al.’s (2009) study, participants completed laboratory measures of working memory, vigilance, fluid intelligence, fluency, and response inhibition in one laboratory session and completed a battery of personality questionnaires in a separate session. In the current study, participants completed the Big Five Inventory immediately following the working memory and attention control measures. It is possible that the procedure, especially considering the discussion of possible testing anxiety mentioned earlier, may have altered which neuroticism items individuals tended to endorse. Follow-up research should investigate this possibility, as well as use multiple measures in an attempt to measure neuroticism with perhaps more convergent validity. Finally, there could simply be differences in samples between the two studies.

Even with these limitations, the present study makes several novel findings in the field of mind-wandering and human cognition. Tests of the Control Failure × Concerns model of mind-wandering have largely focused on individual differences in executive control and their relationships to mind-wandering rates. The personal concerns piece has received considerably less attention, especially from an individual differences perspective. Recent experimental evidence (e.g., Banks et al., 2015; McVay & Kane, 2013) has suggested that priming personal concerns, and perhaps especially negative ones, leads to more mind-wandering, and this effect seems to be particularly pronounced among individuals with high stress reactivity. Because of the large sample and the ability to use structural equation modelling to partial common and unique variance among executive control, neuroticism, and mind wandering, we were able to further delineate sources of mind-wandering. Therefore, we have given further credence and clarification to the Control Failure × Concerns model of mind-wandering and opened doors for future research.

Mind-wandering relates to a variety of important areas of human functioning, including basic cognition, higher order cognition, daily success, happiness, and even certain types of psychopathology. Therefore, a more complete understanding of mind-wandering will aid our ability to understand how and when it occurs, when it is detrimental and when it may help, and how it can inform models of human cognition and emotion. We set out to test the Control Failure × Concerns model of mind-wandering by measuring individual differences in neuroticism, which should measure an individual’s tendency to entertain personal concerns, or similarly the relative salience of personal concern to individuals. By finding relationships among neuroticism, executive control, and mind-wandering, the present study brings new converging evidence for the Control Failure × Concerns model and hopefully opens the door to future areas of research. These results can inform neuroscientific investigations of constructs like psychopathology, deficient attention control, mind-wandering, and the relationships among them, tying together the fields of clinical psychology, cognitive psychology, affective neuroscience, and cognitive neuroscience to give us a more complete understanding of the human cognitive and emotional systems, as well as the complex ways in which they interact.