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The articles that appear in NSPB represent the work of students from graduate psychology departments. Published work includes theory, research, literature reviews, and commentaries on the field. NSPB considers articles from all schools of thought on all topics relevant to psychology. NSPB may be particularly attractive to authors whose work does not fit the missions of larger psychology journals, and those looking to gain exposure to academic publishing. NSPB prides itself on publishing the early work of new and budding scholars.

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Acknowledgements

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Letter from the Editors

Dear Readers,

We are proud to present this issue, which demonstrates the hard work and commitment of our authors, editorial board, layout editor, and everyone who has dedicated their time to make this journal possible. The New School Psychology Bulletin (NSPB) provides aspiring researchers with early exposure to the meticulous process of reviewing and refining manuscripts and avenues for publishing their own work. Moreover, the NSPB serves as a point of convergence for scholars globally.

This issue features work of scholars who span several geographic regions within the United States and a number of countries. The international origins of our authors and review board generate a review process and final published product that promotes diversity and exposure to a wide range of research.

Presently, in its 12th year of operation, the NSPB's commitment to training graduate students in scientific writing and review has never been stronger. This year the training protocol for editorial board members has been augmented to include an in-person APA orientation and peer-review workshop for reviewers in the New York area.

Though the significance of the work published here speaks for itself, we would like to take a moment to acknowledge the social and academic relevance of the selected articles. The topics of these articles address diverse areas of the field including new understandings of situated cognition, the role of stigma in healthcare delivery, the interaction of mental health and substance abuse, the functioning of attention and perception in people with learning disabilities, and therapeutic interventions. Each article in this eclectic issue presents a unique contribution to its respective field of study, serving to promote and influence future research.

Once again, we offer our gratitude to our authors for their dedication and hard work. The publication of this journal has been an incredibly rewarding process, in part due to the unique satisfaction that accompanies the dissemination of graduate student work to the psychological research community. We invite you to join us in celebrating these burgeoning scholars' work and hope you enjoy the subsequent pages as much as we do.

Alissa von Malachowski, Gabriella Santoro & Clinton Merck
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Observing Peripersonal Distance Regulation of Human Affect With the Embodied Distance Test

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We frequently regulate our distance from objects with silent automaticity. Various areas of psychology have studied how we regulate space, though issues with measurement have obscured a grounded interpretation of many findings, as is particularly evident in the long tradition of research on personal space. The Embodied Distance Test (EDT) was developed in response to these longstanding issues in the measurement of spatial behavior and experience in humans, providing a replicable and extensible method for interdisciplinary use. Through calculating difference between predetermined image presentation locations to the participant's later placement locations of the same stimuli, the procedure uses a fairly simple method for indexing spatial distortion. We demonstrate reliable distortion of images of human affect in peripersonal space. Furthermore, we explore empirically-measured differences between explicit and implicit versions of the task which support theoretical concerns regarding the first-person experience of peripersonal space.

Keywords: peripersonal space, embodied cognition, psychological distance, situated cognition, nonverbal behavior

Our bodies seem to automatically adjust and readjust to the space we share with important people and things in our lives (Bargh & Chartrand, 1999). In fact, our sense of space and distance is so automatic and basic, its expression seems to weave throughout many such complex and interesting phenomena such as emotion, the sense of self, and interpersonal relationships. Considered from the third-person perspective, the distance from a body to surrounding objects is simply the measured distance between two objects. In contrast, the first-person perspective – the perspective of experience – shows that distance reflects aspects of the person's whole life situation and is influenced by a host of motivational, emotional, and cognitive processes (Balcetis & Dunning, 2010; Harber, Yeung, & Iacovelli, 2011; Liberman & Trope, 2008). The phenomenologist and philosopher, Maurice Merleau-Ponty, made a strong case for the basic importance of distance in psychology ("depth"):

> More directly than other dimensions of space, depth forces us to reject the preconceived notion of the world and rediscover the primordial experience from which it springs; it is, so to speak, the most 'existential' of all dimensions, because...it is not impressed upon the object itself, it quite clearly belongs to the perspective and not to the things. (1962/2002, p. 298.)

In this quote, Merleau-Ponty addresses the 'existential' nature of depth, highlighting his observation that the first-person experience of space differs qualitatively from the way in which space is typically conceived

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in science; not just in terms of the shape of the space, but in the way the person's perspective is intimately involved in its basic structure. This philosophical position seems to offer a way of understanding deep methodological problems in the tradition of research on interpersonal spatial behavior.

The "stop-distance" task is a foundational method which has been traditionally used in studies of interpersonal spatial behavior (Hayduk, 1978). In this task, participants are explicitly told to inform the experimenter when an approaching confederate experimenter "begins to make the subject feel uncomfortable" (Hayduk, 1978, p. 118). With this experimental situation, the participant is fully involved in the intentions of the experiment and readily gives a consciously-controlled, explicit, verbal indication of their spatial preference.

In contrast to this explicit method are implicit tasks like the chair placement or selection techniques (Hayduk, 1978). In these measures, participants are asked to "pull up a chair" or "take a seat," unaware that the location they choose is covertly measured by the experimenter. In these tasks, participants implicitly indicate their distance preferences through their bodily arrangement within the situation. Measures of this kind are valued as they measure spatial regulation without invoking the complicating factor of the participant's reflective awareness. In this vein, implicit measures are thought to indicate a more "real life" meaning of interpersonal space (Hayduk, 1983, p. 293). We find here that the distinction between implicit and explicit methods in the tradition of interpersonal space research is crucial in impacting spatial perspective. However, these distinctions were often not recognized and may have contributed to confusion across findings as, while they have been taken to measure the same phenomena, they have a rather low intercorrelation (Hayduk, 1978, 1983).

Thus, the equivalence of explicit and implicit distance in the tradition of interpersonal space research may posit a common experiential space across kinds of measurement. Instead, such differences of measurement may alter the perspective of the subject upon the spatial situation in a fundamental way by mixing kinds of first- and third-person perspective experiences in the participants themselves. Further research is needed in order to empirically specify how it is that the experience of interpersonal space can "belong to the perspective" (Merleau-Ponty, 1962/2002, p. 298). In what follows, we propose a measure called the Embodied Distance Test (EDT) and use it to observe such differences in spatial experience. The EDT closely tracks implicit expressions of distance while maintaining the experimental control necessary for research in cognitive and affective neuroscience.

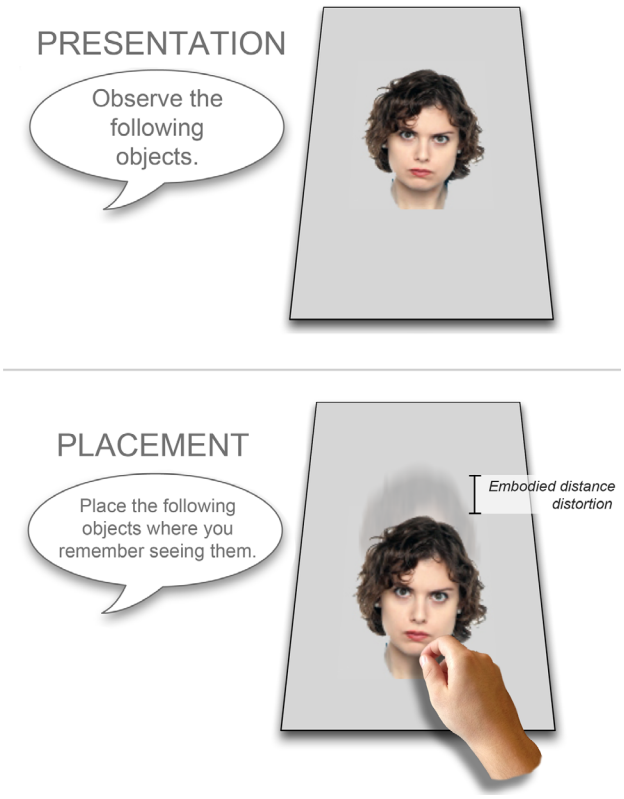

Figure 1a. Walkthrough of the presentation and placement procedure used for the EDT implicit task.
Note. The figure portrays a participant's interaction with a given stimulus. This stimulus would be encountered as one in a series during both the presentation and the placement phases of the procedure. All images were presented in full color.

Method

Participants

All 119 participants were undergraduate students enrolled in an introductory Psychology course participating for course credit. The participants were 60.2% female with the average age of 20.47 (SD

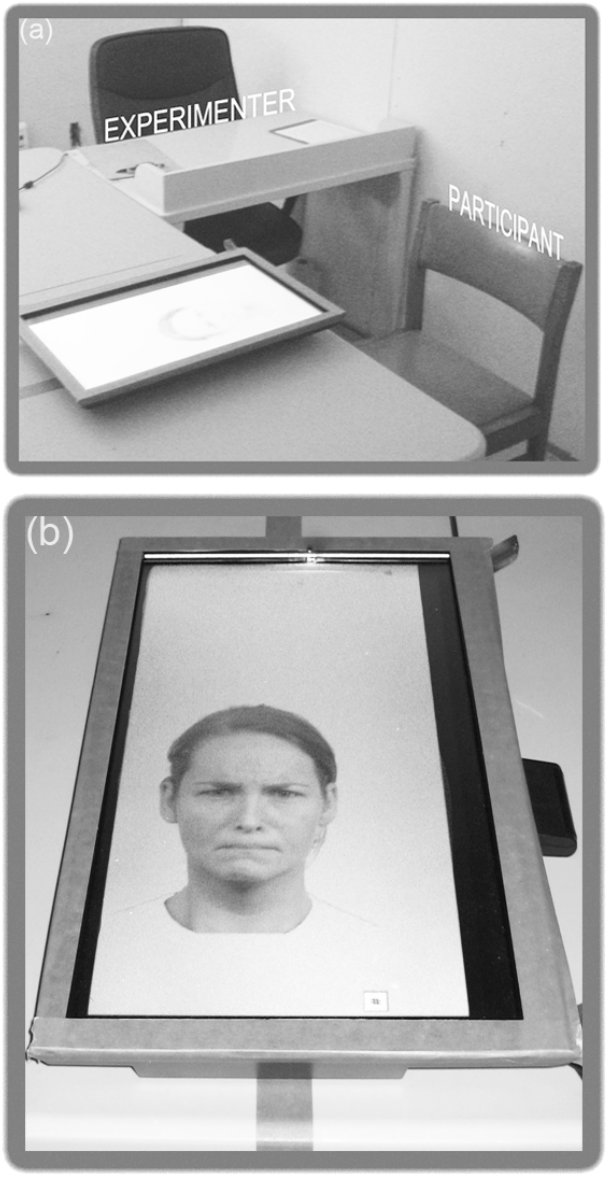

Figure 1b. Overview (a) and participant first-person perspective (b) of the touchscreen EDT used in Studies 2 and 3.

= 3.32). Participants primarily identified as Non-Hispanic White (77.8%). Participants also identified as Other/Not Listed (8.5%), Hispanic or Latino (6%), Black or African American (2.6%), Asian or Asian American (3.4%), American Indian or Alaskan Native (.9%), and one entry was missing. All participants were required to have 20/20 or corrected to 20/20 vision and native fluency in English.

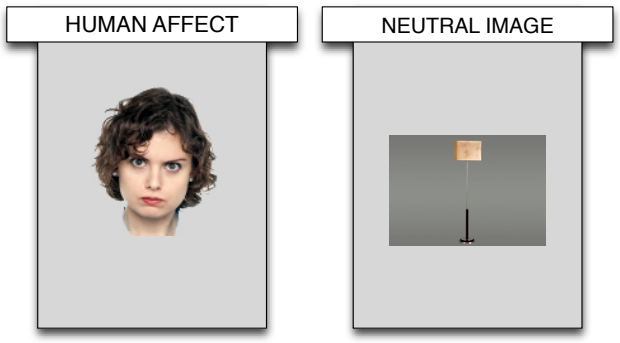

Figure 2a. Example stimuli used.
Note. Not actual Radboud Faces Database or International Affective Picture System images. All images were presented in full color.

Presentation and Placement

At the crux of the EDT method is the presentation-placement procedure. Figure 1a provides a visual walkthrough of this procedure from the participant's first-person point of view. During the presentation phase, a series of stimuli were presented at predetermined locations on a touchscreen surface while the participant was asked to simply observe these stimuli. Subsequently, participants were asked to place each stimulus, one at a time, where they remembered seeing it presented. In this version of the EDT, the stimulus is given at the bottom of the screen, nearest to the participant, for placement. Distance distortion is calculated by taking the difference between the predetermined presentation location and the participant-determined placement location such that negative values indicate distortion of distance toward the participant's body (i.e. Distortion = Placement – Presentation).

Physical Arrangement and Hardware

The EDT apparatus was composed of an Acer 23" T231H LCD touchscreen monitor and a 2.20 GHz AMD Athlon 62 X2 Dual Core Processor 4200+ with 3 GB of RAM running Windows 7. Participants used a stylus to touch the screen. The touchscreen monitor was placed flat on the table and participants sat in a chair at one side of the table. With this arrangement, the left edge of the touchscreen was near the torso of participants, with the right edge of the screen marking

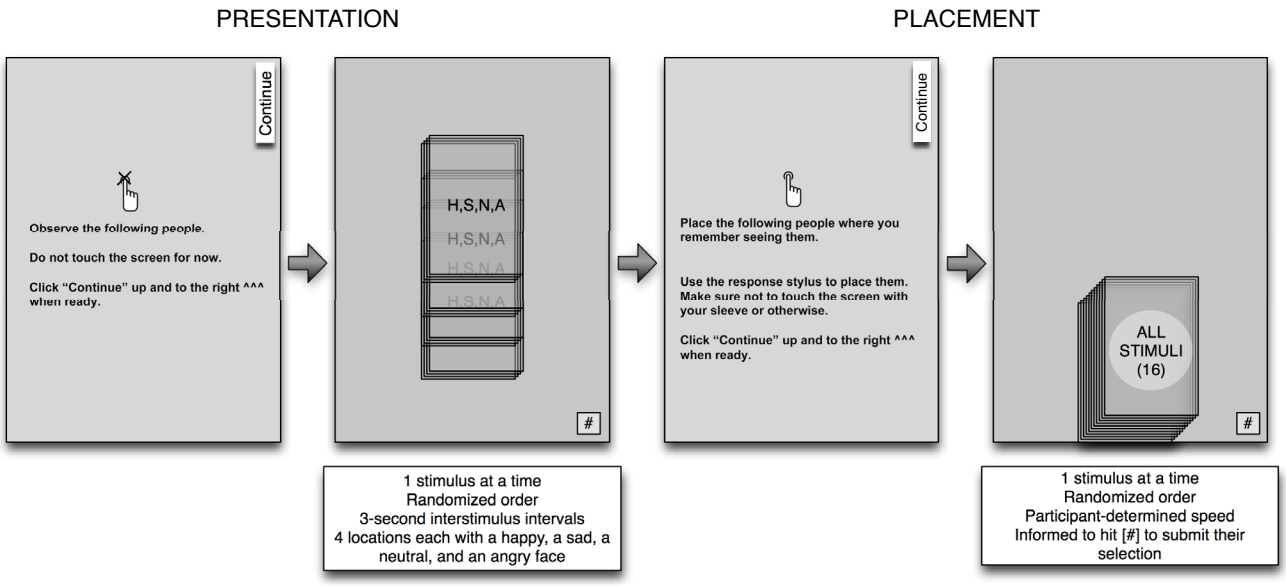

Figure 2b. Schematic of the EDT implicit procedure.

the farthest distance. The experimenter sat out of the participants' line of sight, behind a small desk to the right. Lighting and any visual aspects of experience were held constant across participants. Figure 1b shows the arrangement of the room and the first-person perspective of the participant when facing the screen.

Software and Stimuli

The EDT software was constructed through customized items in Medialab. Items were custom JavaScript-based HTML items, adapting the structure of an open-source Slider applet (Arvidsson, 2002). Stimuli were composed of neutral, nonhuman images (e.g., a lamp) from the International Affective Picture System (IAPS) database (*Mvalence* = 5.06, *SD* = .11; *Marousal* = 2.88, *SD* = .45) and standardized, high-resolution images of individuals demonstrating Facial Affect Coding System-directed affect from the Radboud Faces Database (Langner et al., 2010). The standardization of IAPS means allows for the comparison of our results with other publications using the IAPS database. An Adobe Photoshop CS5 macro cropped, resized, and rotated all images. In the case of the facial affect images a second Photoshop macro was developed to remove hard lines and recolor the background. Image size was standardized to 700 X 1000 pixels or 24.84 X 35.28 cm at 75 ppi resolution. The image alterations gave the stimuli a 'floating' effect on the screen and assured that there were no strong non-facial visual cues (see Figure 2a for an example). Overall, the software was programmed 'sideways', such that the right side of the monitor was farther from the participant. Figure 2a shows example human affect and neutral images in approximate proportions to the touchscreen surface. Locations of image presentation were made constant across types of stimuli.

Procedure

An experimenter greeted and consented the participants when they arrived at the laboratory. During the consent process, participants were told the experiment was "a study of spatial memory." No other indications of space or the hypotheses of the study were made. Participants were then asked to adjust their chair to the spot marked on the floor, informed that they would be using the touchscreen in the experiment, and asked to follow instructions as they appeared on the screen. During the touchscreen portion, participants proceeded through 5 blocks of 16 stimuli each beginning with a practice block. We describe the characteristics of each of these stages of the experimental procedure in detail below. Each

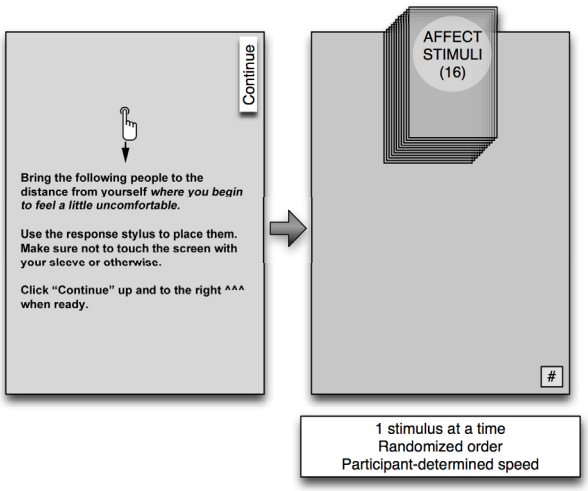

Figure 2c. Schematic of the explicit procedure.

block of the experiment employed one of two types of participant responses (implicit and explicit) and one of two kinds of stimuli (human faces or neutral objects). Instructions of the implicit responding mode of the EDT asked participants to place a series of previously observed stimuli where they remembered seeing them. This mode is of primary interest, as it sought to measure peripersonal distance distortions apart from the participant's direct, conscious knowledge. The explicit instructions, by contrast, directly asked participants to report their preferences for the spatial location of stimuli on the touchscreen surface. For all blocks of implicit responding, stimuli were presented for 3 seconds at one of four locations from the participant. See Figures 2b and 2c for schematic walkthroughs of the implicit and explicit procedures used throughout. Following completion of the touchscreen portion, participants were directed to complete a laptop-based self-report questionnaire in an adjacent room.

Practice: Block 1. Participants were asked to "observe the following people." After presentation of all stimuli, participants were asked to "place the following people where you remember seeing them" (see Figure 2b). One image of each affect (happy, sad, neutral, and angry) was presented at one of the four presentation locations in a randomized order. When later asked to place the images, participants moved the image itself from the bottom of the screen toward where they remembered seeing it and then clicked a box on the lower right corner (from the participant's perspective) in order to submit their response. Following this block, participants were asked if they had any questions about the procedure and were instructed to continue when ready.

Implicit response to human affect: Blocks 2 and 3. Following block 1 participants encountered the same standard presentation-placement arrangement with 16 new facial affect stimuli at the same four presentation locations. No longer naïve to the task, participants were now aware that they would need to place each stimulus from the outset. Each of the four kinds of affective stimuli (happy, sad, neutral, and angry) was presented at each of the four locations. Gender of the actor for each location was reversed across two randomly-assigned conditions, such that each gender was represented by each emotion at each location. All affect images featured novel actors to the participant and utilized Caucasian actors.

Implicit response to neutral images: Block 4. Block 4 followed the same structure of blocks 2 and 3, but used the set of 16 neutral IAPS images as stimuli. Each stimulus was presented at one of the same four locations utilized in previous blocks.

Explicit preference for human affect: Block 5. In the final block of stimuli, participants were asked to "bring each person toward you until you begin to feel slightly uncomfortable" in order to assess explicit preferences for the images. Here, 16 images, four of each affect, were presented at the far edge of the screen and participants moved the image to their desired location before submitting their choice by clicking a box on the right near edge of the monitor. See Figure 2c for a visual schematic of this process.

Results

Data collected from 119 participants yielded 9,520 distance observations (80 observations each). Of these observations 1.2% were invalid (N = 125) due to technological malfunction. These malfunctions were sporadic across cases in the database and did not seem to follow any clear trend. Given the large amount of observations per case and the flexibility of our data analytic method in managing missing data, this relatively small group of data was not of concern.

Table 1
Descriptive estimates of distancing effects in cm on the touchscreen surface.

Stimulus category	Mean	SE	df
Overall	-.82	.84	3.04
Angry[a]	-1.01	1.11	3.10
Happy[c]	-.59	1.11	3.10
Neutral[b]	-1.30	1.11	3.10
Sad[a,b]	-1.23	1.11	3.10

Note. Different superscript letters indicate significant differences between stimulus groups with Bonferroni correction for multiple comparisons.

Implicit Distance Behavior

We turn to an analysis of our guiding hypothesis that the EDT measure could detect reliable differences in distance distortion. Overall, participants placed human affect images .82 cm closer to their body than the location in the initial presentation. See Table 1 for descriptive statistics for each kind of affect.

Human affect: Blocks 2 and 3. First, we evaluated the effect of facial affect on distance distortion in Blocks 2 and 3. We performed a linear mixed effects model with fixed effects of affect (4 levels: happy, sad, angry, neutral), condition (2 levels: counterbalancing locations of male and female actors by emotion), block number (2 levels: Block 2 or Block 3), and two interactions: affect by block and affect by condition. Random effects in the model were participant (119) and presentation location (4).

Supporting our hypothesis for an affect-distancing effect, we found that the kind of expressed affect significantly impacted implicit distancing, $F(3, 3676) = 10.86$, $p < .001$ (see Table 2). Post-hoc Bonferroni corrected pairwise comparisons of the affect-distancing effect indicated that happy faces were distanced farthest from the body (ps $< .003$) while angry faces were distanced farther than neutral faces ($p < .04$), but not significantly farther than sad faces (though in that direction; $p = .12$). There were no significant differences in distancing between sad and neutral faces ($p = .60$). Block was also a significant effect in the model, indicating that stimuli in the second block was placed farther from the participant's body than during the first block, $F(1, 3676) = 11.02$, $p = .001$. Condition and both interactions were not significant in the model (ps $> .2$).

Neutral objects versus human affect. In order to explore the general distancing effects of different blocks, we built a linear mixed effects model with block (4 groups, blocks 1-4) as a fixed effect and participant (119) and presentation location (4) as random effects. We proceeded to construct a linear contrast, which tested the general effect of faces against the effect neutral IAPS stimuli (block 4 vs. blocks 2 and 3). There was a significant effect of stimulus category on calculated distancing such that faces, on the whole, were placed closer to the participant's body than neutral objects, $t(5588) = -9.50$, $p < .001$.

Exploration of Other Influences on Implicit Distancing Effects

The distancing effect from the presentation-placement method may have been influenced by alternative factors including autocorrelation of responses, whether accuracy was influenced by the presentation of stimuli early or late in order (i.e., primacy and recency effects on memory), and memory decay between presentation and placement phases of the blocks. We examined these effects on the standard EDT implicit version of using images of human affect (blocks 2 and 3).

Autocorrelation of responding. In order to examine potential autocorrelation effects, that one stimulus placement depends on the placement of prior stimuli, we produced autocorrelation and partial autocorrelation function (ACF and PACF) tables for the placement means. These functions indicated that there was no evidence of first nor higher-order autocorrelation or partial autocorrelations in participant placement, suggesting that consecutive placements were temporally independent, ps $> .05$.

Primacy and recency of memory encoding. One might predict that primacy and recency memory encoding may impact later distancing effect. In order to test this influence, we examined a linear mixed model with participant (119) and block (2) as random effects and presentation order as a continuous fixed effect. We found no evidence for an effect of presentation order (1-16) in the model, $F(1, 3283.92) = 4 * 10^6$, $p = .998$.

Table 2
Mixed effects model summary of the implicit distancing effects.

Fixed effects source	Numerator, Denominator df	*F*	*p*	Random effects parameter	Variance estimate	SE
Intercept	1, 3.07	.88	.42	Residual	1401428.68	32688.75
Affect	3, 3676.00	10.86	0.00	Presentation Location	767201.79	627619.59
Block (2 or 3)	1, 3676.00	11.02	0.00	Subject	255396.76	39130.84
Stimulus Location Condition (1 or 2)	1, 117.00	1.08	0.00			
Affect * Block	3, 3676.00	1.51	.21			
Affect * Condition	3, 3676.00	.30	.83			

Order of memory retrieval. We then examined the effect of placement order (1-16) as a continuous fixed effect in the model with participant (119) and block (2) as random effects. We found a significant effect of placement order in the model, $F(1, 3282.85) = 16.96$, $p < .001$, indicating that items placed later in the blocks were distanced farther from the participant's body. This corresponds with the overall effect of block order on distancing (later blocks were distanced farther) and seems to indicate an underlying artifact related to increased time in the experiment with increased distancing perhaps due to practice.

Explicit Preferences

We examined distance preferences by asking participants to "bring the people toward yourself until you begin to feel uncomfortable," an analogue to the predominantly verbal method in the personal space research literature. We examined differences in preferences across kinds of human affect by building a linear mixed effects model with participant (119) as a random effect and affect (4 levels: happy, sad, neutral, or angry) as a fixed effect. We found that different emotions were reliably preferred at different distances from the participants' bodies, $F(3, 1782) = 40.05$, $p < .001$. Post-hoc explorations indicated that angry and sad faces were preferred farthest away from the participant's body with neutral faces being preferred between those faces and happy faces preferred closest.

Comparison of Explicit and Implicit Responses to Human Affect

In order to statistically explore the differential distancing of affect images based on explicit preference and implicit movement, we compared distancing on the implicit version of the EDT task (blocks 2 and 3, combined) and the explicit version of the EDT task (block 5). First, we computed the z-score for within each version, creating a common metric. Then, we constructed a linear mixed effects model with fixed effects of EDT instructions (2 levels: implicit vs. explicit), affect (4 levels), and the interaction of EDT instructions and affect. As before, participant (119) was entered as a random effect. In a full-factorial model, we found a significant interaction effect between EDT version and affect, $F(3, 5586) = 25.75$, $p < .001$, indicating a large impact of task instruction on distancing between conditions based on affect. There was an overall effect of affect in the model, $F(3, 5586) = 10.78$, $p < .001$.

Discussion

Distancing in peripersonal space on the implicit version of the task was sensitive to different kinds of facial affect and different categories of stimuli, suggesting further potential of this new measure. We also determined how distancing on the explicit version, similar to the verbal reporting of personal space research, was distinct from distancing on EDT implicit version, similar to nonverbal tasks of personal space research. We explored the influence of other psychological processes on peripersonal

space distortion, determining that response order impacted distancing such that those stimuli encountered later tended to be distanced further from the body. Regarding the impact of memory, we found that various indices of memory did not influence distortion. Overall, we confirmed that we could observe distortions of peripersonal space with the EDT across kinds of human affect, that all human affect images were reliably distorted toward the participants' body when compared to neutral nonhuman images, and that implicit and explicit modes of the EDT task (using human images across both) showed reverse spatial trends.

Our exploratory findings regarding specific distancing intensities across kinds of human affect on the implicit version of the task partially correspond with previous research. First, previous research has demonstrated the tendency for angry individuals to be experienced as closer to one's body (Dosey & Meisels, 1969; Wilkowski & Meier, 2010). Second, our findings correspond with similar findings which indicate that negative stimuli, while explicitly preferred away from the body, may actually be implicitly perceived as closer to the body than neutral or positive stimuli (Balcetis & Dunning, 2010; Coombes, Cauraugh, & Janelle, 2007).

Commensurability of measures has long been a problem in personal space research and looms over further progress in the study of spatial aspects of emotion and cognition. The flexibility of the EDT method responds to measurement distinctions which have historically "clouded" personal space research (Hayduk, 1978, p. 129) and provides a methodological link for the study of verbal experiences of space with nonverbal, embodied experiences. We anticipate that future research can benefit from the adjustable extensibility of the procedure: flexibility of stimuli, flexibility of spatial arrangement, and flexibility of instruction. The software can be modified to use any set of images at controlled presentation durations and can be synced with other media or intervention, e.g., sound and electric shock. Further, being a controlled, computerized task, instructions can be varied quite easily. The EDT procedure can account for relevant distinctions between measures and a clearer account of embodied and psychological distancing experience. The EDT complements previous methods of spatial measurement by providing a way for participants to spontaneously distance stimuli and by calculation of distancing, which involves both direction and degree. The EDT is limited in its scope of measuring meaningful peripersonal space distortion in that it necessarily requires participants to interact with images rather than tangible objects (e.g., human affect images rather than other humans). As such, interaction with objects is contained to the touchscreen surface, which inherently limits the possibilities of spatial closeness and distance. While it does appear promising for further research, the EDT also involves what appear to be practice effects, where the placement of later stimuli seem less prone to the influence of emotion.

Currently, much of the research on psychological distance relies on self-report measures via Likert scales, third-person perspective verbal reports of distance, or first-person perspective verbal reports. Some conceptual (Merleau-Ponty, 1962/2002) and empirical perspectives (Hayduk, 1983) indicate that nonverbal enaction of distance is, at least under some conditions, functionally distinct from explicit verbal report of distance (cf. Balcetis & Dunning, 2010). Understanding the conditions under which the first-person experience of distance diverges from third-person measurement may indicate important aspects of the function of spatial experience – particularly in peripersonal space - for regulating emotion in day-to-day life.

Theoretical work from the field of phenomenology calls for reconceptualization of human behavior in terms of enactments of organism-environment relationships. For example, conceptualizing the brain as a mediating organ between our bodies and the world rather than the sole seat of cognition (see Fuchs, 2011), we can understand disjunctions between real space and remembered space as ways in which we manifest our bodily selves in our environments. Further, elements of embodiment have been identified as integral to the experience of the self and these advances have led to promising hypotheses about the nature of experiential space in constituting and maintaining psychopathology (Fuchs & Schlimme, 2009).

Merleau-Ponty (1962/2002) described the difference between perspectives on human perception

in his discussion about the difference between breadth, the perception of distance between two external objects and depth, the perception of distance from the situated, first-person experience. He argues that this is due, in part, to the inherently spatial nature of having a body, which permeates all perception and action. Measurements of embodied space involve the participant in spatial interactions as they construct their sense of being an embodied self with silent automaticity. Examining embodiment, in part through the human regulation of embodied distance, can lead to a better empirical understanding of the characteristics of the individual's perceptual being-in-the-world among objects of experience (Heidegger, 1927/2008). Accordingly, the subject-object relationship itself might be considered more phenomenologically basic – and contain more explanatory power of behavior – than examining the characteristics of either in isolation (see Lenarčič & Winter, 2013). Spatial behavior provides a ground for testing more effectively the dynamics of these highly complex relationships through empirical means. With proper measurement techniques, these principles can be examined empirically and contribute toward understanding the phenomenology of verbal and nonverbal space, toward a richer picture of a second-person cognitive neuroscience.

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Spatial Attention Shifting and Phonological Processing in Adults with Dyslexia

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According to Hari and Renvall's (2001) sluggish attentional shifting (SAS) hypothesis people with dyslexia have a central deficit in attention shifting. Here we assessed whether a group of adults with dyslexia showed impaired performance on shifting visual spatial attention. Twelve adults with dyslexia and 12 control adult participants took part in a Posner style focused attention orientation task and a shift attention orientation task. The participants also completed standardized measures of single word reading, spelling, IQ, phonological processing, speed of processing and non-word reading. Overall, the dyslexic participants showed the same pattern of performance as the control participants on the attention-orienting task, but completed the tasks at a consistently slower pace. Specifically, participants in both groups found short target presentation intervals more difficult than longer target presentation intervals, and participants in both groups were more impaired when cue-to-target information was invalid 20% of the time (shift task) than when it was valid all of the time (focused task). However, the group with dyslexia was significantly more impaired across the board. While this is indicative of slower attentional processing in this group, attention shifting was not a significant unique predictor of non-word reading performance after age, general ability, and speed of processing had been controlled for. Accordingly, we conclude that while a deficit in cognitive processing speed (e.g. sluggish attention) may characterize dyslexia, it is not the central difficulty. Rather, a deficit in cognitive processing speed occurs alongside a core difficulty with phonological awareness. Thus phonological awareness is the central difficulty for individuals with dyslexia who may also present with deficits in cognitive processing speed.

Keywords: dyslexia, phonological processing, sluggish attentional shifting, attention orientation, adult dyslexia

Dyslexia is characterized as a specific learning difficulty disorder that affects word reading accuracy, spelling accuracy, and fluency and can be comorbid with a range of other sensory, motor, and intellectual difficulties that are not related to intellectual capability (Rose, 2009). The phonological deficit hypothesis posits that individuals with dyslexia find mapping phonemes onto graphemes difficult because they have poorly specified phonological representations (see Snowling, 2000 for a review). There is a substantial body of cognitive research to support this theory (Carroll & Snowling, 2004; Georgiewa et al., 2002; Pennington, Van Orden, Smith, Green, & Haith, 1990; Ramus et al., 2003; Scarborough, 1990; Mayringer & Wimmer, 2000), and poor phonological awareness, namely skill in the awareness and manipulation of linguistic units such as words, syllables and rimes, is a largely undisputed feature of dyslexia (Goswami, 2003).

This language-based hypothesis has been strengthened by neurobiological studies. Weak phonological (feature) sound and orthographic (written) skills seen in dyslexia are associated with reduced activation in several areas of the left hemisphere, including the left middle, inferior, and superior temporal cortex in addition to the middle occipital gyrus (Paulesu et al., 2001; Shastry, 2007; Temple et al., 2001; Wimmer, Hutzler, & Wiener, 2002), all of which are areas highly relevant to language processing. However, the failure of this hypothesis to account for the high incidence of motor and sensori-perceptual deficits experienced by people with dyslexia is considered by some researchers to be a persistent weakness (see Ramus et al., 2003 for discussion).

A contrasting view of the underlying problem in dyslexia is encapsulated by Hari and Renvall's (2001) non-modality specific, sluggish attentional shifting (SAS) hypothesis. According to this hypothesis, people with dyslexia are slow to disengage their attention from a given stimulus as a direct consequence of dysfunction in the right parietal lobe. If the assertion is correct, this impairment should be particularly apparent when dyslexics are presented with rapid stimuli sequences, such as speech stimuli. Hari and Renvall (2001) proposed that individuals with dyslexia have to process larger chunks of phonological input, as they are unable to disengage rapidly from incoming speech stimuli. They argue that these larger units of phonological information would be harder to specify accurately than smaller, more manageable units, leading to poorly formed phonological representations. In addition, difficulty with disengaging rapidly from visual stimuli would lead to slower mapping of graphemes to phonemes, which could further impair the functioning of the sublexical reading route. Thus, the phonological deficit seen in dyslexia is considered to be a consequence of sensory cognitive overload caused by an underlying attentional dysfunction.

Support for the SAS hypothesis comes from neurobiological evidence, which shows that lesions to the right parietal lobe are linked to acquired dyslexia (Brunn & Farah, 1991), and that the right parietal lobe is activated when normal adults read pseudo-words and real words (Mayall, Humphreys, Mechelli, Olson, & Price, 2001). There is also a growing body of research supporting the proposal that people with dyslexia have impaired visual attentional processes on measures such as the attentional blink paradigm and visual search tasks (e.g., Buchholz & Davies, 2005; Buchholz & McKone, 2004; Casco & Prunnetti, 1996; Iles, Walsh, & Richardson, 2000; Hari, Valta, & Uutela, 1999; Roach & Hogben, 2004; Ruddock, 1991; Visser, Boden, & Giaschi, 2004; Williams, Brannan, & Latirgue, 1987). Research indicates that these attentional deficits seem to occur at the sensori-perceptual level, rather than at the level of executive function (Stoet, Markey, & López, 2007).

The present study is particularly concerned with participants' ability to shift the spatial focus of attention, a process that is critical for the operation of the sublexical reading route. Different graphemic units of words are effectively situated in different spatial locations, requiring the ability to shift the focus of spatial attention rapidly and accurately. Typically, spatial attention shifting has been explored using a version of the traditional Posner (1980) cueing task. This involves the presentation of a fixation point, followed by a cue for the location of the target, which can either be valid (where the target subsequently appears in the same location as the cue) or invalid (where the target appears in a different location than the cue).

The standard finding from research with children and adolescents is that response times (RTs) for the valid trials are faster than RTs for the invalid trials in typically-developing participants (e.g., Schul et al., 2004; Facoetti, Lorusso, Cattaneo, Galli, & Molteni, 2005). The relative delay for the invalid trials is thought to reflect the time required to shift the attentional spotlight from the invalid cue location to the true target location. Accordingly, the further away the target is from the invalid cue location the longer the time lag. However, at cue-to-target intervals greater than 250ms this effect tends to disappear, arguably because the participant's attention starts to focus on novel locations, which reduces the advantage initially provided by a valid cue (Schul et al., 2004).

Facoetti et al. (2005) used this paradigm to compare attention shifting in children with dyslexia to age-matched controls and reading-aged matched controls. When the cue-to-target interval was set at 100ms, both control groups showed the expected faster responses to the target for valid cued trials compared to invalid cued trials. In contrast, the children with dyslexia performed no faster on the valid trials compared to the invalid trials. When the cue-to-target interval was increased to 250ms, the dyslexic participants showed a significant advantage for the valid cued trials, whereas the two control groups performed similarly on trials with valid cues compared to trials with invalid cues. Facoetti et al. (2005) concluded that the children with dyslexia showed a slower attentional capture than controls, supporting Hari and Renvall's (2001) hypothesis that attentional shifting in children with dyslexia is sluggish. Critically, they also concluded that the dyslexic group's attention shifting was slower than younger children of the same reading age. This

detrimental performance in comparison to a reading-matched control group led them to conclude that poor spatial attention may be a cause of reading difficulties, rather than a product of poor reading ability.

However, similar studies have produced somewhat different results. Heiervang and Hugdahl (2003) also used the Posner cueing task to compare attention shifting in children with dyslexia (aged 10-12 years) with age-matched controls. They found that the dyslexic participants were generally slower to respond to the target stimuli than the controls across both short (100ms) and long (800ms) cue-to-target intervals. However, in contrast to Facoetti et al. (2005), Heiervang and Hugdahl found that the dyslexic participants showed the same pattern of performance as the typically-developing children. They suggested that dyslexic participants might have difficulty recruiting the necessary cognitive resources to complete the tasks at speed, which would support a general speed of processing deficit rather than a specific problem with shifting attention. Heiervang and Hugdahl also included a no-cue condition in their study, which led to slower RTs in the control group but did not appear to detrimentally affect the RTs of the dyslexic group. This suggests that the cue is of no benefit to the group with dyslexia. Interestingly, they also demonstrated that this group difference masked a considerable amount of variability in the dyslexic groups RTs in comparison with the control group.

It appears then that while several studies have found that people with dyslexia have deficits in engaging, disengaging, and shifting attention, these effects have not been established as consistent either across or within samples. Critically, while group based deficits have on occasion been identified (e.g., Facoetti et al., 2005; Hari et al., 1999), very little attention has been paid to individual participant performance, and it is therefore difficult to determine whether attentional problems characterize a subset or the majority of people with dyslexia (Buchholz & Davies, 2007). Furthermore, there is a need to ascertain more clearly whether attention deficits might play a causal role in the development of phonological deficits.

To this end, Facoetti, Ruffino, Peru, Paganoni and Chelazzi (2008) directly explored whether attentional processing can account for variance in phonological skill. Using the attentional blink paradigm, they demonstrated that 77% of children with dyslexia in their sample had difficulty with attentional engagement, and 54% had difficulty with rapid disengagement from target stimuli. Facoetti et al. (2008) carried out a series of hierarchical regressions with non-word reading as the outcome variable, demonstrating that non-spatial attentional processing accounted for around 24% of the unique variance in non-word reading accuracy, after controlling for age and verbal reasoning. While this may be considered evidence for a significant role of attention in phonological reading processes, this finding should be interpreted with caution. Since the focus of Facoetti et al.'s (2008) study was on non-verbal, visual processes and the role they have to play in phonological processing, it would arguably have been appropriate to control for general nonverbal ability in the regression analyses. Moreover, the attentional blink task is undoubtedly closely linked to speed of information processing (Catts, Gillispie, Leonard & Kail, 2002; Kail & Hall, 1994) and has been previously demonstrated to account for unique variance in reading performance (e.g., Catts, Gillispie, Leonard & Kail, 2002; Kail & Hall, 1994; see Bonifacci & Snowling, 2008 for a different view on this matter). Therefore, to properly assess the amount of variance in non-word reading accounted for by attentional processes, it is necessary to control age, non-verbal ability, and basic speed. Otherwise it is impossible to say that variance is (in some part) attributable to these factors.

Aims and Hypotheses

Following previous research, we sought to investigate whether adults with dyslexia have a deficit in shifting spatial attention. In addition, the study sought to explore whether spatial attention is a unique predictor of non-word reading accuracy when controlling for age, non-verbal ability, and speed of processing. To address these aims, a task was needed that would (a) assess ability to shift attention and (b) assess speed of processing, whilst keeping all other demands on cognitive resources constant. This would enable speed of processing to be effectively controlled in any analyses used to explore the role of attention in predicting non-word reading. To achieve this we have used a modified version of a task, used

by Schul et al. (2004), which provides reaction time (RT) data for a focused attention condition (which assesses speed of processing) and a shift attention condition (which assesses attentional shifting).

In the focused task, participants responded to a target (an arrow pointing in a specific direction: up, down, left or right) by moving a computer mouse and clicking on the arrow. Moving the mouse caused the target to immediately be masked (a multi-arrow mask) and the participants clicked on the arrow in the mask that corresponded with the position and direction of the original target arrow. In this task the target consistently appears in the same location as the cue. By varying the target-to-mask (T-M) time interval, we were able to assess the amount of time needed to process the target effectively. This task also enabled us to measure motor response speed for the dyslexics relative to the typical readers.

The shift task was similar to the focused task except that the cue was only valid 80% of the time. In addition to varying the validity of the cue (and T-M interval), the cue-to-target (C-T) interval was also varied in the shift task. Longer C-T intervals allowed the participants more time to shift their attention. Therefore, if adults with dyslexia have slower attentional orienting than the controls, this should be reflected in less accurate responses to the invalid cues at shorter C-T intervals. In line with the literature (e.g., Catts et al., 2002; Heiervang & Hugdahl, 2003; Kail & Hall, 1994), we further hypothesized that the dyslexic participants would have a speed of processing deficit, demonstrated by slower responses than the control participants, across both the focused and shift tasks. Finally, the study aimed to assess whether attention-shifting ability contributes to non-word reading performance. In order to build on previous research, the analyses assessed the contribution of attention shifting after controlling for age, speed of processing and non-verbal ability. If attention shifting is a key cognitive deficit in developmental dyslexia, then it should contribute towards the variance in non-word reading performance.

Method

Participants

A group of 12 adults with dyslexia and 12 typical adult readers were recruited and matched on age and non-verbal reasoning. Dyslexic readers possessed a diagnosis of dyslexia from either a qualified Educational Psychologist or a Specialist Teacher. Descriptive statistics for the age, general ability and literacy measures for the two participant groups are displayed in Table 1. A series of independent samples *t*-tests confirmed that the dyslexic group were achieving significantly lower spelling raw scores, $t(22) = 2.96$, $p < .05$, and reading scores than the control group, $t(22) = 2.08$, $p < .05$. No significant differences were found between the groups on verbal ability, non-verbal ability, or overall IQ ($ps > 0.05$).

Measures of Literacy and General Ability

Wechsler Abbreviated Scale of Intelligence. The matrix reasoning and vocabulary subtests of the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) were used to assess cognitive ability. For the vocabulary subtest, participants gave verbal descriptions of increasingly sophisticated items; for example, "What is a bird?" or "Tell me what 'blame' means." The matrices subtest involved identifying missing 'pieces' of picture patterns or sequences, requiring participants to select the most appropriate fit from five possible responses. The standard assessment procedure for both subtests was carried out in accordance with the manual.

The Wide Range Achievement Test 4 (WRAT 4). The reading and spelling subtests of the WRAT 4 (Wilkinson & Robertson, 2006) were administered. Participants were required to read and spell single words of increasing difficulty and unfamiliarity. Standardized test instructions were adhered to throughout. This test measures word recognition, decoding skills, and single word spelling ability.

The Graded Non-Word Reading Test. To assess phonological decoding we administered the The Graded Non-Word Reading Test (Snowling, Stothard, & McLean, 1996). In this short assessment, participants read aloud five practice items followed by ten phonetically regular non-words of one syllable and ten of two-syllables. Performance was measured in terms of response accuracy.

The Perin False Spoonerism Test. The Perin False Spoonerism Test (Perin, 1983) was administered to assess phonological processing skills. An example of a spoonerism task is the participants being given

Table 1
Mean scores and standard deviations for tests of general ability and literacy.

	Dyslexic group		Control group	
	M	*SD*	*M*	*SD*
Age (years)	34.79	12.56	32.24	15.56
Vocabulary	57.25	15.75	60.33	10.11
Vocabulary (T-score)	50.50	15.98	55.33	10.15
Matrix reasoning	26.41	3.29	26.08	4.17
Matrix reasoning (T-score)	55.00	7.47	54.00	7.84
IQ (standard)	105.25	18.37	108.25	14.09
Reading	56.41	9.60	62.83*	4.76
Reading (standard)	95.08	19.83	105.75*	10.70
Spelling	37.00	10.32	46.67	4.68
Spelling (standard)	90.58	19.38	108.93*	10.71

Note. Data are raw scores unless otherwise stated. Standard refers to standardized test scores with a mean of 100 (*SD* = 15). T-score refers to standardized scores with a mean of 50 (*SD* = 10). *$p < .05$

(verbally) the name of a famous individual (e.g., David Bowie) and being asked to reverse the initial phonemes to produce (articulate) two new words or non-words (i.e., Bavid Dowie). The participants were familiarized with the concept of spoonerisms if unsure and received three practice items, followed by eighteen test items. A response outside of a five second time limit received no score but feedback and encouragement were given after this time. The participants were scored on the number of correct spoonerisms articulated out of eighteen.

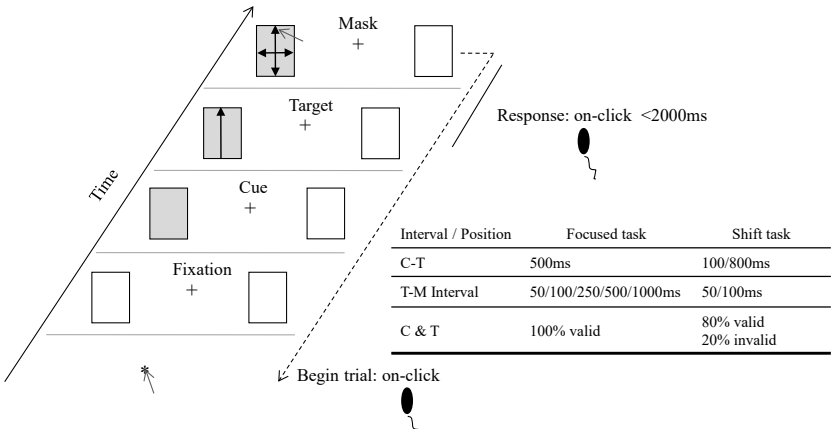
Speed of Processing Tasks

Adult Intelligence Scale. Two standard pen and paper speed of processing tasks were used from the Wechsler Adult Intelligence Scale (WAIS-III; Wechsler, 1997): symbol search and digit symbol coding. In the symbol search task, participants sought to match either of two target symbols in an array of five. For the digit symbol-coding task, the numbers 1 to 9 corresponded to individual, non-verbal symbols. Participants inserted the appropriate symbol into a sequence of numbered boxes. For each task, participants worked as quickly as possible until the stimulus set was complete or until two minutes had elapsed. The number of correct items for each task was totaled, a high score reflecting faster speed of processing.

Focused and shift tasks

The focused task and shift tasks, adaptations of Schul et al.'s (2004) attentional orienting experiments, were written using Superlab 4 and were carried out on a Toshiba laptop computer (Windows XP), with a 15" LCD color screen. Participants sat approximately 56cm from the display. The focused task provides an index of perceptual processing speed and motor speed. The shift task provides an indication of attentional orientating speed. Both tasks are illustrated in Figure 1.

Focused task. In the focused task, participants had to respond (indicate location) as quickly as they could to a target arrow that was masked at different time intervals. At the beginning of each trial the participants were presented with an asterisk in the center of the screen, which they had to click using the computer mouse to begin the trial. This ensured that each trial was initiated with the mouse positioned in the middle of the screen. Participants were then presented with a central fixation point (+) and two empty target boxes (measuring 3.8 cm^2) located at an approximately 8.3º visual angle to the left and right of fixation (the mouse cursor was hidden). One hundred milliseconds later, the participants were cued to either the left or the right box. The cue was an increase in hue (color green) over a period of 500 ms (C-T interval). The target, a black 3.7 cm arrow orientated up, down, left or right, was presented immediately after the cue, in the same box. The target was then masked, using a multi-arrow mask (arrows orientated in all 4 directions), according to a given (variable) target-to-mask (T-M) interval (50, 100, 250, 500, 1000 ms). Upon detecting the target the participant had to move the mouse cursor (now visible in the center of the screen) as quickly as they could and click on the location of the head of the target arrow. Clicking the screen completed the trial, returning the participant to the asterisk screen. In all, the focused task comprised two blocks of 80 trials with a short (self-paced) break between blocks. In one block the cue and target were consistently presented in the left box, in the other



Interval / Position	Focused task	Shift task
C-T	500ms	100/800ms
T-M Interval	50/100/250/500/1000ms	50/100ms
C & T	100% valid	80% valid 20% invalid

Figure 1. Illustration of the Focused task and Shift task procedure.

block they were consistently presented in the right box (order of side counterbalanced). Each participant received a minimum of 6 practice trials, which could be repeated until the participant felt familiar with the task.

Shift task. The shift task was similar to the focused task, but with some important differences. As before, participants began the trials by clicking the asterisk and this was followed by a fixation cross and two boxes. One of the boxes then increased in hue before the target arrow appeared. The target was then masked using the multi-arrow mask. Participants responded as in the focused task, using the mouse. This time however, both the C-T and the T-M intervals were varied. The C-T intervals were 800 (long cue) or 100 ms (short cue) whilst the T-M intervals were 50 or 100 ms. Cue validity was also manipulated. On 80% of the trials the cue and target appeared in the same spatial location (valid: right cue – right target), on the remaining 20% the cue and target appeared in different spatial locations (invalid: right cue – left target). The shift task comprised 6 blocks of 80 trials (480 in total). Half of the blocks had the valid C-T trials appearing on the left and the other half had the valid C-T trails appearing on the right. Participants completed all of the left valid (right invalid) or the right valid (left invalid) blocks before switching over to the opposite blocks (order counterbalanced). Each participant received a minimum of 6 practice trials, which could be repeated until the participant felt familiar with the task.

Procedure

Participants took part in two testing sessions (lasting around 45 minutes each), with a short break between the two sessions. In the first session they were administered the WASI matrix reasoning and vocabulary tests, WRAT 4 reading and spelling subtests, and the phonological tasks. In the second session they completed the WAIS speed of information processing tasks, followed by the focused task and the shift task. Testing was carried out one-to-one, in a quiet, distraction-free room. All procedures were cleared (January 2008) by the University School of Social Sciences Ethics Committee before testing took place. Participants gave signed consent to take part in the research and were aware of the task requirements before testing began. All participants were fully de-briefed following completion of the tasks.

Data Analysis

Two dependent variables were calculated for each of the attention tasks: response time (RT) and performance accuracy. Response time scores were calculated by finding the mean RTs in log ms for all target directions on both the left and right side responses (separating out valid and invalid trials in the shift task). Accuracy was a percentage of correct (e.g., left-up-target, left-up-response) responses, collapsed over target direction (up, down, left, right) and side of presentation (left block, right block) for each of the levels of the combined factors.

Response times longer than 2000 ms were terminated, recording a 'miss' for that trial. In line with Schul et al. (2004), a response time of 2000 ms was considered sufficient time to allow even participants with slow motor reactions to record their response. Since the participants were responsible for initiating successive trials, the inter-stimulus interval time was governed by them. Miss trials were removed from the RT analysis (as were responses shorter than 200 ms) but were included in the accuracy calculation as an inaccurate response. No erroneous click responses (e.g., left-up-target response for left-down target) were observed.

Table 2
Mean scores and standard deviations for measures of phonological processing, symbol search and digit coding.

	Dyslexic group		Control group		Group difference
	M	*SD*	*M*	*SD*	
Spoonerisms (max = 18)	7.67	6.30	15.58	2.47	$t(22) = 4.05$**
Non-word reading (max = 20)	14.92	5.33	19.17	1.03	$t(22) = 2.71$*
Symbol search (raw score)	32.00	7.59	39.12	5.86	$t(22) = 2.59$*
Digit coding (raw score)	64.67	16.29	89.67	17.52	$t(22) = 3.62$**

*$p < .05$, **$p < .01$

Table 3
Focused task performance (% correct accuracy) for the control and dyslexic groups.

T-M Interval	50		100		250		500		1000	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control	99.20	1.90	99.50	1.20	99.70	.90	99.70	.90	100.00	0.00
Dyslexic	93.50	14.00	96.10	7.20	98.20	4.50	98.20	3.10	98.70	3.10

Table 4
Focused task reaction times (in log ms) for the control and dyslexic groups.

T-M Interval	50		100		250		500		1000	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control	2.94	.07	2.93	.06	2.88	.06	2.88	.07	2.89	.07
Dyslexic	3.02	.08	3.00	.07	2.96	.08	2.96	.08	2.97	.10

Results

All data are reported to 2 decimal places. ANOVAS are reported with Generalized Eta Squared (η^2_G) effect sizes in accordance with Olejnik and Algina (2003), and power estimates. Group performance on the measures of spoonerisms, symbol search, digit coding, and non-word reading are presented in Table 2. It can be seen that the dyslexic participants performed significantly poorer than the controls on all of these measures.

Focused Task

Performance accuracy. Informal observations of these data suggest markedly more variability in errors for the dyslexic group compared with the control group. Both groups were near to ceiling in almost all cases (see Table 3). Formal analysis (mixed ANOVA) of the performance accuracy data revealed no significant main effect of group, $F(1, 22) = 2.44$, $MSE = 90.18$, $p > .05$, $\eta^2_G = .06$, or T-M interval, $F(1.46, 32.05) = 2.53$, $MSE = 14.26$, $p > .05$, $\eta^2_G = .04$, and no group by T-M interval interaction $F(1.46, 32.05) = 1.49$, $MSE = 14.26$, $p > .05$, $\eta^2_G = .02$.

Reaction time. Informal observations of the reaction time data suggested greater variability in reaction times for the dyslexic group compared with the control group (see Table 4). This was most pronounced at the shorter latencies. Formal analysis of the reaction time data (mixed ANOVA) revealed a statistically significant main effect of group, $F(1, 22) = 7.44$, $MSE = .03$, $p < .05$, $\eta^2_G = .24$, with the dyslexic participants being significantly slower than the control participants. There was also a significant main effect of T-M interval, $F(2.77, 61.03) = 33.78$, $MSE = .00$, $p < .05$, $\eta^2_G = .09$, but no group by T-M

Table 5
Shift task performance (% correct accuracy) for the control and dyslexic groups.

Cue Validity	Invalid							
C-T Interval	Short				Long			
T-M Interval	50		100		50		100	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control	98.60	2.10	99.70	1.20	97.60	4.20	99.70	1.30
Dyslexic	90.30	18.20	93.40	11.60	87.50	21.10	89.90	15.50
Cue Validity	Valid							
C-T Interval	Short				Long			
T-M Interval	50		100		50		100	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control	99.30	1.30	99.50	.80	99.70	.50	99.90	.30
Dyslexic	96.10	4.90	97.80	2.40	97.00	5.00	99.10	1.60

interval interaction, $F(2.77, 61.03) = .56$, $MSE = .00$, $p > .05$, $\eta^2_G = .00$. Holm (1979) corrected, pairwise comparisons of the T-M interval revealed significant differences between the two shortest intervals (50 and 100 ms) and the 250, 500, and 1000 ms intervals, $p < .05$. None of the other comparisons were significant (ps > .05).

Shift Task

Performance accuracy. Informal observations of the performance accuracy data suggest poorer (lower) and more variable performance for the dyslexic group compared with the control group (see Table 5). Formal analysis (mixed ANOVA) of these data showed a main effect for validity (invalid: 94.6%, valid: 98.6%), $F(1, 22) = 4.38$, $MSE = 173.99$, $p < .05$, $\eta^2_G = .05$, but no main effect of C-T interval, $F(1, 22) = 1.19$, $MSE = 11.38$, $p > .05$, $\eta^2_G = .00$, T-M interval, $F(1, 22) = 3.67$, $MSE = 34.18$, $p > .05$, $\eta^2_G = .01$ or group, $F(1, 22) = 3.90$, $MSE = 352.55$, $p > .05$, $\eta^2_G = .08$. There was a validity by C-T interval interaction (invalid short: 95.5%; invalid long: 93.7%; valid short: 98.2%; valid long: 98.9%), $F(1, 22) = 5.54$, $MSE = 14.44$, $p < .05$, $\eta^2_G = .01$. No other interactions reached statistical significance (ps > .05). Holm (1979) corrected, pairwise comparisons of the validity by C-T interval interaction revealed significant differences between the valid and invalid long C-T intervals, $p < .05$. No other comparisons were significant (ps > .05).

Reaction time. As with the accuracy data, informal observations suggested greater variability in reaction times for the dyslexic group compared with the control group, being most pronounced at the shorter latencies (see Table 6). Formal analysis of the reaction time data (mixed ANOVA) revealed a statistically significant main effect of group (control: 2.93 log ms; dyslexic: 3.02 log ms), $F(1, 22) = 7.18$, $MSE = .04$, $p < .05$, $\eta^2_G = .18$, a main effect of validity (invalid: 3.01 log ms; valid: 2.94 log ms), $F(1, 22) = 68.49$, $MSE = .00$, $p < .05$, $\eta^2_G = .12$, and a main effect of T-M interval (50: 2.99 log ms; 100: 2.96 log ms), $F(1, 22) = 42.60$, $MSE = .00$, $p < .05$, $\eta^2_G = .03$, but no effect of C-T interval, $F(1, 22) = .12$, $MSE = .00$, $p > .05$, $\eta^2_G = .00$. There was also a significant validity by T-M interval interaction (valid 50: 2.98 log ms; valid 100: 2.95 log ms; invalid 50: 3.00 log ms; invalid 100: 3.03 log ms), $F(1, 22) = 4.85$, $MSE = .00$, $p < .05$, $\eta^2_G = .00$, a significant group by validity by T-M interval interaction (control valid 50: 2.91 log ms; control valid 100: 2.88 log ms; control invalid 50: 2.99 log ms; control invalid 100: 2.97 log ms; dyslexic valid 50: 3.00 log ms; dyslexic valid 100: 2.98 log ms;

Table 6
Shift task times in log ms for the control and dyslexic groups.

C-T Interval	Short				Long			
T-M Interval	50		100		50		100	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control	2.99	.07	2.96	.08	2.99	.07	2.97	.06
Dyslexic	3.06	.07	2.98	.09	3.08	.09	3.02	.09

C-T Interval	Short				Long			
T-M Interval	50		100		50		100	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Control	2.91	.08	2.88	.07	2.91	.08	2.88	.08
Dyslexic	3.01	.09	2.98	.08	3.00	.08	2.98	.09

dyslexic invalid 50: 3.07 log ms; dyslexic invalid 100 ms: 3.01 log ms), $F(1, 22) = 6.66$, $MSE = .00$, $p < .05$, $\eta^2_G = .00$ and a group by validity by C-T interval by T-M interval interaction, $F(1, 22) = 5.60$, $MSE = .00$, $p < .05$, $\eta^2_G = .00$. No other effects or interactions were significant ($ps > .05$).

In order to explore the group by validity by C-T interval by T-M interval interaction, 95% confidence intervals were calculated and plotted on the means. These data are presented in Figure 2. For clarity of comparison the graphs have been broken down in to 6 smaller displays. Each of the 6 graphs shows RT performance across each C-T interval and T-M interval, for both groups, but differ across validity. The 95% confidence intervals suggest that there are significant differences between control valid response times, and both the dyslexic valid and dyslexic invalid response times for all C-T, T-M intervals ($p < .05$). Significant differences were also observed between control valid and control invalid response times for the 100 ms C-T, 800 ms T-M interval condition, $p < .05$, and dyslexic invalid and control invalid 50 ms C-T, 800 ms T-M interval condition, $p < .05$. No other comparisons were significant ($ps > .05$).

The means, standard deviations and ranges for the three speed indices are presented in Table 7. As indicated by the standard deviations and range scores there is considerable variance in performance, though much of this is carried by one individual. One-sample *t*-tests indicate significantly slower motor speed, $t(11) = 3.47$, $p < .05$, but normal perceptual processing speed and attentional orientating. Correlations also indicated a significant positive correlation between motor speed and perceptual processing speed, $r = .59$, $p < .05$. No other comparisons were significant ($ps > .05$). Removal of the aforementioned individual from the data set ($N = 11$) extinguished this correlation, $r = .33$, $p > .05$ while all other observations (including *t*-tests) remained constant.

Predicting Non-Word Reading Performance

To assess whether attention shifting is a useful predictor of non-word reading performance, a series of hierarchical regressions were carried out. These analyses need to be interpreted with caution considering the relatively small sample size. In contrast to the analyses carried out by Facoetti et al. (2008), the current study assessed the contribution of attention shifting after controlling for speed of processing.

Attention shifting in these analyses refers to the z-scores of participants' reaction times to the inconsistent trials on the shift task (i.e., the trials where a shift in attention was required). Speed of processing was indexed by participants overall performance on the focus task, with mean z-scores of reaction time data being taken across all five target-to-mask intervals (50, 100, 250, 500 and 1000 ms).

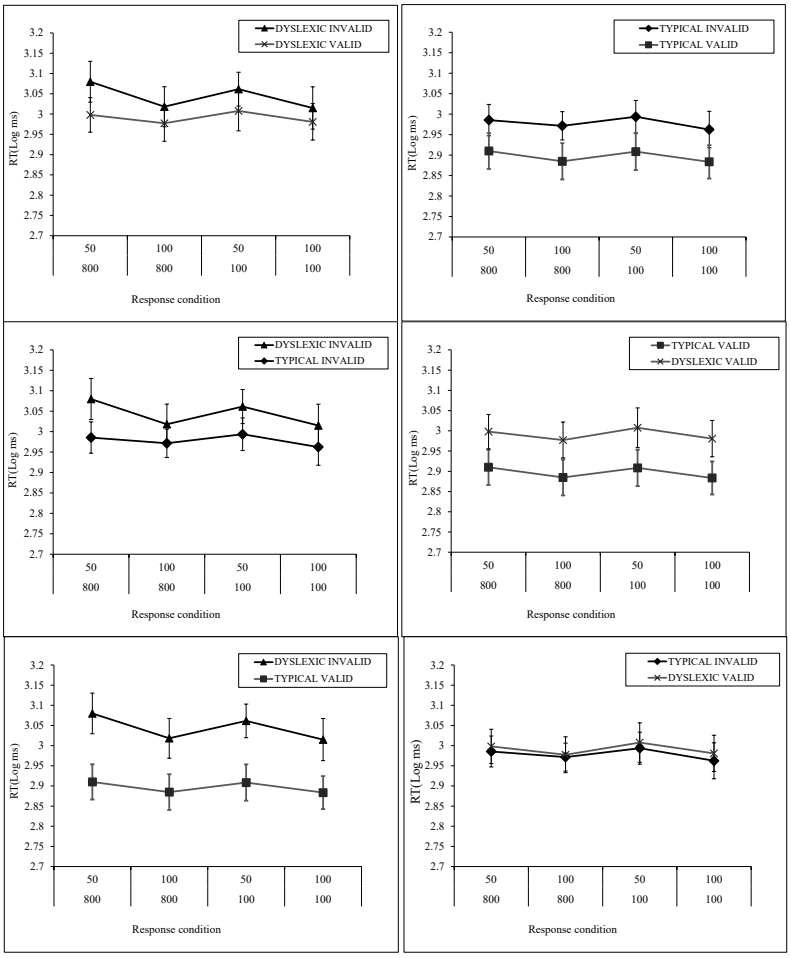


Figure 2. Breakdown of group by validity by C-T interval by T-M interval interaction with 95% confidence intervals.

The first set of regression analyses showed that attention shifting was a significant predictor of non-word reading after controlling for age and nonverbal ability, accounting for around 39% unique variance ($p < .05$). However, attention shifting accounted for only 0.6% after controlling for speed of processing ability (focus task performance), and was no longer a unique predictor of reading performance ($p > .05$).

Similarly, attention shifting accounted for 20% of the unique variance in non-word reading after controlling for age and verbal ability ($p < .05$). However, attention shifting was no longer a unique predictor after controlling for speed of processing, accounting for only 0.4% of the unique variance in non-word reading in this model ($p > .05$).

It should be noted that both speed of processing and attention shifting accounted for additional variance in non-word reading outside of phoneme awareness skills (spoonerisms task) when entered independently at step 3 of the regression analysis ($p < .05$). It is likely that this was because of the speed of processing component shared by both tasks, since when the focus and shift task are entered simultaneously into the regression analysis neither accounts for a significant amount of unique variance ($p > .05$).

Discussion

The aim of this study was to evaluate the proposal that impaired shifting of attention is a core deficit in developmental dyslexia, as suggested by Hari and Renvall's (2001) sluggish attentional shift hypothesis. In order to directly build on previous research (e.g., Facoetti et al., 2008), the current study assessed whether spatial attention was a unique predictor of non-word reading accuracy. The findings indicate that the dyslexics were slower to respond on both the focus and shift tasks than the controls. At first glance this would appear to support a deficit in speed of processing, as suggested by previous literature (e.g., Catts, Gillispie, Leonard & Kail, 2002; Kail & Hall, 1994; Nicolson, 1994). Accordingly, if the dyslexics had difficulty in shifting spatial attention rapidly, this should have been particularly prominent when C-T intervals were very short. However, there was no significant difference in accuracy between the dyslexic and control group at short cue-to-target intervals. Rather the dyslexics appeared to mirror the performance of the control group, albeit doing so at a reduced speed.

The pattern of performance accuracy was straightforward. In the focused task, the dyslexic group was as accurate as the control group across all target–to-mask intervals. In the shift task, no overall differences were observed between the groups.

Table 7
Mean speed indices (in log ms) and correlations for the dyslexic group.

	M	*SD*	*Range*	Perceptual processing	Motor speed	Attentional orientating speed
Perceptual processing	2.3	6.22	[-1.74]–[21.56]	-		
Motor speed	1.27	1.27	[-1.11]–[3.47]	.59*	-	
Attention orientating score	-.43	1.94	[-3.88]–[2.33]	.25	.07	-

*$p < .05$

The dyslexic group and the control group were less accurate (and more variable) on the invalid trials than on valid trials, though this was most pronounced between the valid and the invalid cue-to-target (800 ms) intervals (as evidenced by the C-T interval by validity interaction). In short, although the dyslexic group appeared to be more variable, in terms of accuracy their performance mirrored the control group on both tasks.

Similarly, the RT data for the dyslexic group was effectively a slower and slightly more variable version of the control group's performance. In the focused task both groups tended to be slower for the shorter T-M intervals (50 and 100 ms) than the longer T-M intervals (250, 500, 1000 ms), but the control group was faster overall: there were no interactions. In the shift task, the interactions lead to the conclusion that performance for the control group was significantly faster on the valid trials as compared with the performance of the dyslexic group on the invalid trials.

Critically, our adult data support Heiervang and Hugdahl's (2003) findings for children with dyslexia. That is to say that whilst the dyslexic group performance is slower overall, it is still largely comparable with the control group, and follows the same pattern of costs/benefits at different C-T and T-M intervals.

In addition, analysis of the speed indices and correlations suggest that poorer performance in the dyslexic group may be attributed to slower motor speed and not perceptual or attention processing speed. This finding is consistent with known motor difficulties in some, but not all dyslexic individuals (e.g., Ramus et al., 2003; White et al., 2006). Indeed, the correlation between perceptual and motor processing (and the subsequent finding that this was carried by only one particular participant) is consistent with variability in non-phonological deficits across populations with dyslexia (e.g., see Valdois et al., 2003). The impaired scores of the dyslexic group on the WAIS speed of processing tasks could also be a consequence of slower motor skills, since both of these tasks are pencil and paper based and reflect cognitive processing speed alongside motor performance.

Interestingly, the findings seem to emphasize the potential role of speed of processing in non-word reading, as opposed to the ability to shift spatial attention. The shift task accounted for around 40% of the unique variance in non-word reading when entered after age and non-verbal ability. However, once speed of processing was controlled by entering focus task performance in the analysis, attention shifting was no longer a significant predictor of non-word reading. While the focus task was no longer a significant unique predictor when entered into regression analyses at the same time as the shift task, this finding can be attributed to the two tasks both drawing heavily on speed of processing resources, leaving little unique variance to be accounted for.

The greater variability in the dyslexic group's reaction time and accuracy data is particularly worth noting. Previous research findings have been inconsistent in terms of demonstrating attentional deficits in dyslexia, and it is possible that this may be due to the existence of qualitatively different dyslexia profiles or subgroups. Valdois et al. (2003) used an in-depth case study analysis to highlight that dyslexic individuals can have strikingly different cognitive and behavioral profiles. They found that a deficit in visual attention was associated with a "surface" dyslexia profile rather than the classic "phonological" dyslexic. "Surface" dyslexics are known to have particular difficulty with reading exception words as opposed to non-words, although researchers have argued this is due to a mild phonological deficit

alongside limited exposure to print (see Griffiths & Snowling, 2002 for a discussion).

It is plausible to speculate that weaknesses in attention could lead children to engage less with the reading process, leading to lower exposure to print than those children without attention deficits, and a subsequent "surface" dyslexia profile. Detailed case studies like the work carried out by Valdois et al. (2003) may prove invaluable in helping to illuminate the individual differences that are inevitably masked by group based research designs. In addition, the suite of studies that have explored the outcomes of children who are genetically "at risk" for developing dyslexia (Guttorm et al., 2005; Pennington & Lefly, 2003; Snowling, Gallagher & Frith, 2003) provide a template for future work in this field.

Limitations

We are aware that our sample size is small and that our analyses are potentially underpowered. Accordingly, we acknowledge that our findings should be treated with caution since we may not have detected all of the potential and more nuanced effects within and between the groups. However, the issue of appropriate sample size and power is a complex one (Hoenig & Heisey, 2001; Thomas, 1997), being impacted by a number of factors including research aims and general patterns of effects found in the pertinent literature. With this is in mind we would argue that we are confident that our sample size was sufficiently large enough address the broad question of differences in processing speed between dyslexic populations and controls and that finding a difference in processing speed is uncontroversially consistent with the pertinent literature (i.e., Facoetti et al., 2005; Hari & Renvall, 2001). Equally, we feel confident that we have enough power to explore the role of processing deficits alongside phonological skill, since our findings are supported elsewhere in the literature where non-word reading performance was controlled (i.e., Heiervang & Hugdahl, 2003). We would nevertheless hope that future research in this and other labs would involve larger samples where more nuanced effects might be discovered within and between the groups. Though on this note we would add that the greater variability in the dyslexic group's reaction time and accuracy data, seen here, is entirely consistent with individual variation in dyslexic populations (e.g., Valdois et al., 2003) and offers a potentially interesting avenue for future research.

In conclusion, the present study provides no support for the hypothesis that impaired shifting of attention underpins the phonological deficit known to characterize dyslexia. While these findings must be interpreted with caution considering the small sample sizes, they add to a growing body of literature that emphasizes the potential role of processing speed alongside phonological skills in persistent reading difficulties (e.g., Catts et al., 2002; Kail & Hall, 1994).

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Client-Directed Outcome-Informed Work: An Overview

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Considerable research supports the notion that regardless of specific treatment modality and in some instances, treatment provider or format, clients are likely to benefit from psychotherapy. The psychotherapy literature appears to have shifted its focus from simply evaluating comparative treatments—and the resultant equivalence of outcome—to identifying the hypothesized underlying mechanisms or common factors found to account for client improvement. An alternative perspective to the traditional philosophy of psychotherapy research and practice, in which researchers strive to delineate disparities between various treatment modalities and identify the most efficacious or effective for a given disorder, involves examining the commonalities. The common factors perspective is the basis from which the Client-Directed Outcome-Informed (CDOI) approach was derived. This paper presents a general overview of CDOI and reviews the empirical evidence supporting the relative contribution of the various factors responsible for client improvement. Implications for routine clinical practice are also described. The CDOI approach may best be conceptualized as an underlying framework to which all clinicians, regardless of theoretical orientation or scientific discipline, may ascribe.

Keywords: psychotherapy, common factors, client-directed, outcome-informed

Saul Rosenzweig first introduced the notion of the "Dodo Bird Verdict" in 1936, and subsequently ignited the field's lasting interest in the topic (e.g., Luborsky, Singer, & Luborsky, 1975; Luborsky et al., 2002). The Dodo Bird Verdict was coined to illustrate Rosenzweig's supposition that (1) virtually all active psychotherapies were equally effective, and (2) the common factors across the various psychotherapies were so pervasive that differences in the outcomes derived from comparisons of various treatment modalities would be minimal. The Dodo Bird Verdict is based on a scene from Lewis Carroll's (1865/1920) classic tale, Alice's Adventures in Wonderland, involving a fictional character, the Dodo. In the story, the Dodo proposed that a number of additional characters run a Caucus race in an effort to dry themselves after they had become wet by Alice's tears. The participants then all ran around at different rates and in different directions until they were dry. When the Dodo was asked who had won the competition, his now famous verdict was simply that given all participants were dry, "Everybody has won and all must have prizes" (Carroll, 1865/1920, p. 33). It is important to note, however, that the Dodo failed to measure how far each participant had ran or for how long. This passage has several important implications for clinical practice, psychotherapy research (e.g., the need for scientific rigor), and the multitude of psychotherapy treatments available to clients. The Dodo Bird Verdict has since served as a metaphor for the state of psychotherapy treatment outcomes research (Duncan, 2002).

Some 40 years later, Rosenzweig's (1936) initial hypothesis was confirmed and for the first time, an empirical basis in support of a common factors approach among psychotherapies was presented (Luborsky et al., 1975). Luborsky et al.'s (1975) seminal review of the comparative psychotherapy treatment literature found that although most clients benefited from psychotherapy despite differences in the specific treatment modality, there were relatively small differences in outcome comparisons between different treatment modalities.

Accumulating evidence has since emerged to provide additional support for the existence of the Dodo Bird Verdict in the context of differing psychotherapy modalities (e.g., Barth et al., 2013; Driessen et al., 2013; Joyce, Wolfaardt, Sribney, & Aylwin, 2006; Smith & Glass, 1977; Smith, Glass, & Miller, 1980; Stevens, Hynan, & Allen, 2000; Stiles, Shapiro, & Elliot, 1986; Wampold et al., 1997). Luborsky et al. (2002) replicated and extended

their initial findings almost three decades later and concluded that Rosenzweig's hypothesis was not only still fitting but was "alive and well." Specifically, Luborsky et al. (2002) examined 17 meta-analyses of active treatment comparisons to determine the relative efficacy of pairs of different active psychotherapies in comparison with each other. The authors reported a mean uncorrected absolute effect size for Cohen's d of .20 (i.e., an average difference between any two group means of 20% of the standard deviation), which was small and non-significant. Interestingly, after accounting for the role of the therapeutic allegiance of the researchers, the effect size differences in outcomes between the various active psychotherapies were even further reduced, indicating that the observed group differences may be attributed to the influence of a strong therapeutic alliance.

Research has demonstrated that the Dodo Bird Verdict prevails not only across different treatment modalities but extends across clinicians and treatment provision formats as well. That is, not only is no specific modality of psychotherapy consistently superior to any other for any particular presenting problem (e.g., generalized anxiety, panic, phobias, depression, alcohol or drugs, grief, disordered eating, marital or sexual problems, children or family, work, stress), but psychologists, psychiatrists, and social workers do not differ in their effectiveness as clinicians (Seligman, 1995). There were also no differences in outcome between clients receiving psychotherapy alone and those receiving both psychotherapy and medication. However, it is important to note that although the treatment sample from Seligman (1995) was relatively diverse in that it was comprised of clients with a wide array of presenting problems, the sample may be viewed as falling on the less severely disturbed end of the mental health continuum for clinical samples (i.e., it did not include clients with severe mental illness such as schizophrenia). Clients treated by paraprofessionals (e.g., university professors selected on the basis of their ability to form understanding relationships) have also been shown to experience, on average, comparable levels of improvement relative to clients treated by experienced professional psychotherapists (Bright, Baker, & Neimeyer, 1999; for review see Montgomery, Kunik, Wilson, Stanley, & Weiss, 2010; Strupp & Hadley, 1979). Further, self-help materials have been shown to be as effective as group or individual treatment for select mood, anxiety, and substance use disorders (Cuijpers, Donker, Straten, Li, & Andersson, 2010; Heather, Whitton, & Robertson, 1986; Lidren et al., 1994; Miller & Taylor, 1980).

Common Factors Perspective

Now, more than 35 years after Luborsky et al.'s (1975) groundbreaking findings and an outpouring of studies conducted to support or refute the Dodo Bird Verdict (e.g., Barth et al., 2013; Poulsen et al., 2014), the literature appears to have shifted its focus. That is, researchers appear to have focused on identifying the common factors across treatments that are likely responsible for favorable clinical outcomes rather than simply evaluating comparative treatments. An important modern contribution to the common factors approach was Lambert's (1992) four-factor model of change derived from his extensive review of the diverse psychotherapy treatment outcomes literature. Lambert identified four therapeutic factors found to account for client improvement in the context of psychotherapy: (1) extratherapeutic, (2) common factors, (3) expectancy or placebo, and (4) techniques. Lambert's four-factor model was later modified to expand the term *common factors* from its original meaning of non-specific, relational factors to include all four factors under the overarching umbrella term of common factors (Miller, Duncan, & Hubble, 1997). Miller et al.'s (1997) modified common factors model was comprised of: (1) client/extratherapeutic factors, (2) relationship factors, (3) placebo, hope, and expectancy factors, and (4) model/technique factors. The following sections will describe the four common factors and briefly review the empirical evidence supporting the relative contribution of each of these factors to client improvement in the context of psychotherapy.

Client/Extratherapeutic Factors

Individual client characteristics (e.g., resilience, religious faith, motivation, openness), in addition to social support and unforeseen interactions and events thought to operate outside of the client's control prior to entering treatment, constitute client/extratherapeutic

factors (Miller et al., 1997). An empirical review of the vast psychotherapy treatment outcomes research found that 40% of improvement in clients may be attributed to these factors (Assay & Lambert, 1999). Thus, the Dodo Bird Verdict may hold true given one very important element is held constant in the context of all psychotherapies, regardless of orientation: the client (Bohart, 2000). Some authors (e.g., Miller et al., 1997) have suggested that the client may be the most important and influential contributor to outcome in psychotherapy.

Clients seeking psychotherapy treatment rarely experience impairment in a single domain of functioning (e.g., Barkham, Stiles, & Shapiro, 1993; Markarian et al., 2010), and present with a variety of client/extratherapeutic factors that may complicate treatment and potentially lead to a poorer prognosis if left unaddressed (Appleby, Dyson, Altman, & Luchins, 1997; Carroll, Powers, Bryant, & Rounsaville, 1993; McLellan et al., 1994; McLellan, Arndt, Metzger, Woody, & O'Brien, 1993; McLellan, Grissom, Zanis, & Randall, 1997). Thus, it is important that clinicians incorporate techniques that consider and address such factors. For instance, the perception and receipt of social support have been regarded as important extratherapeutic and common factors that may serve as meaningful areas to focus on in the course of psychotherapy treatment (Hogan, Linden, & Najarian, 2002). Several prognostic indicators or predictors of response to psychotherapy treatment have also been identified, and point to the value of addressing the client's environment and related extratherapeutic factors (e.g., marital status, legal involvement, employment, cultural factors, acculturation) in the context of psychotherapy (Alvidrez, Azocar, & Miranda, 1996; Chan, Shaw, McMahon, Koch, & Strauser, 1997; Hamilton & Dobson, 2002; Jarrett, Eaves, Grannemann, & Rush, 1991; Knight, Hiller, Broome, & Simpson, 2000).

Relationship Factors

Relationship factors represent a wide range of relationship-mediated variables that occur between the clinician and client, and are present among all psychotherapies regardless of the clinician's theoretical orientation. Relationship factors include the core clinician-provided variables (e.g., warmth, genuineness, unconditional positive regard, empathy) described by Carl Rogers (1959), client-provided variables (e.g., perception and client-rated quality of the relationship), and, most notably, the broader concept of the therapeutic alliance. The therapeutic alliance (i.e., the collaborative relationship between the client and clinician; Bordin, 1979), which encompasses both clinician and client contributions, has been found to have a significant effect on clinical outcome and is a significant predictor of psychotherapy treatment success with respect to clinical improvement, treatment engagement, and retention (Connors, DiClemente, Carroll, Longabaugh, & Donovan, 1997; Krupnick et al., 1996; Meier, Barrowclough, & Donmall, 2005). Relationship factors as a whole have been found to be the most important clinician-related contributing factor and account for 30% of successful outcome variance in psychotherapy (Assay & Lambert, 1999). In order to improve outcomes, additional work in the area of evaluating the potential mediators and moderators of treatment effectiveness, as they relate to relationship factors, is warranted.

Placebo, Hope, and Expectancy

Placebo, hope, and expectancy factors refer to the portion of client improvement that occurs simply because the client is receiving treatment of some kind. In other words, these three therapeutic factors reflect the level of change presumably due to both the client's knowledge of being treated and his or her beliefs derived from an assessment of the credibility of the psychotherapy itself and related techniques. Therefore, client improvement, as it relates to placebo, hope, and expectancy, is believed to be the product of the positive and hopeful expectations associated with the use and implementation of a particular psychotherapy (Miller et al., 1997). The relative contribution of these factors to psychotherapy outcomes has been shown to account for 15% of client improvement (Assay & Lambert, 1999). Although the assessment of the client's expectations for treatment may prove useful from a clinical perspective, it also has the potential to strengthen future research efforts in this area given the availability of relevant treatment expectancy data.

Model and Technique Factors

Model and technique factors are unique to specific psychotherapies and their respective theories of change. For instance, cognitive-behavioral therapy (CBT) for alcohol use disorders is a structured treatment approach based on the principles of social learning theory that focuses on understanding a client's drinking behavior in the context of his or her environment, cognitions, and feelings (Kadden et al., 1999). Cognitive-behavioral therapy for alcohol use disorders posits that clients who manifest maladaptive beliefs and behaviors may be able to learn appropriate coping strategies that would allow them to more effectively manage negative affect and ultimately cut down or abstain from alcohol use. The main techniques utilized include developing basic drink refusal skills, coping with cravings and high-risk situations, challenging maladaptive cognitions, managing thoughts about alcohol and drinking, and establishing a social network that will support recovery (Kadden et al., 1999). Likewise, CBT for social anxiety disorder includes various cognitive and behavioral strategies such as cognitive restructuring, development of a fear and avoidance hierarchy, exposure to feared situations, social skills training, and applied relaxation techniques (Hope, Heimberg, & Turk, 2010). Thus, the specific techniques (e.g., cognitive restructuring of maladaptive beliefs) and associated underlying model of behavior change distinctive to a particular psychotherapy represent the fourth class of common factors, and have been found to account for 15% of client improvement (Assay & Lambert, 1999).

Client-Directed Outcome-Informed Work

An alternative perspective to the traditional medical model of psychotherapy research, in which researchers strive to delineate disparities between various treatment modalities and identify the most efficacious (i.e., performance under controlled conditions) or effective (i.e., performance under "real-world" conditions) for a given disorder, involves examining the commonalities. The common factors perspective, as described above, is the basis from which the Client-Directed Outcome-Informed (CDOI; Miller & Duncan, 2000b) approach was derived. The CDOI approach may be best conceptualized as not just another contestant in the race, but rather an underlying framework to which all clinicians, regardless of theoretical orientation or scientific discipline, may ascribe. The CDOI approach involves tailoring psychotherapy treatment to each client based on the systematic collection and incorporation of client feedback. Clinicians, therefore, may use CDOI to guide their clinical work while creatively using whatever model is deemed to best fit the individual needs of the clients they serve in an effort to achieve successful outcomes. According to Miller, Duncan, and Hubble (2002), any form of psychotherapy may be considered client-directed and outcome-informed when clinicians purposely incorporate three important elements into their practice: (1) enhancing the factors across theories that account for successful outcome, (2) using the client's theory of change to guide their selection of techniques and integration of various treatment models, and (3) informing treatment through the utilization of psychometrically sound assessment measures of the client's experience of process and outcome.

The Enhancement of Factors across Theories

Research findings from numerous quantitative comparisons of different active psychotherapy treatments all point to the value of highlighting the commonalities across psychotherapies, particularly the single largest contributor to change, extratherapeutic factors (e.g., Berman, Miller, & Massman, 1985; Crits-Christoph, 1992; Luborsky et al., 1975; Luborsky et al., 1999). An investigation of the contribution of unique and shared process variables to outcome found that client's improvement was predicted by two shared factors: the therapeutic alliance and the client's emotional involvement (Castonguay, Goldfried, Wiser, Rague, & Hayes, 1996). As previously noted, specific models and techniques accounted for only 15% of outcome variance (Assay & Lambert, 1999). Available models, therefore, provide limited insight into the essential elements or underlying psychological mechanisms responsible for their respective success. Interestingly, strict adherence to a particular model and associated techniques, in an attempt to correct problems in the therapeutic alliance, has been found to correlate

negatively with outcome (Castonguay et al., 1996). In other words, the emphasis of psychotherapy should not be on the specific model and techniques, but rather the alliance formed between the clinician and the client, and perhaps most importantly, the client's ongoing evaluation of the treatment experience as a compass to better inform treatment techniques.

In fact, a call for a paradigm shift has been proposed from the traditional model-driven approach to one focused on translating the vast comparative psychotherapy outcomes literature into pragmatic practice (Duncan & Miller, 2000a, 2000b; Duncan, Miller, & Sparks, 2004; Duncan, Sparks, & Miller, 2000; Miller & Duncan, 2000a). Rather than matching clients to specific treatments, the focus should be on matching treatments to the individual needs of clients through the incorporation of a systematic assessment of clients' perceptions of process and outcome. Such a shift involves assigning clients a key role in determining and informing the delivery of their own treatment and is needed to enhance the benefit of any particular model of treatment (Miller & Duncan, 2000a). Thus, placing clients at the forefront of their change via the provision of feedback regarding treatment progress and alliance information into standard psychotherapy practices has been shown to improve clinical outcomes (Anker, Duncan, & Sparks, 2009; Howard, Moras, Brill, Martinovich, & Lutz, 1996; Reese, Norsworthy, & Rowlands, 2009). Operating from a client-informed perspective, or simply conducting psychotherapy within the context of the client's own theory of change, also provides for the additional benefit of allowing a clinician to integrate multiple theoretical orientations and related techniques (Duncan & Miller, 2000a).

The Client's Theory of Change

Many commonly accepted and frequently used empirically-supported psychotherapy treatments operate from the perspective of the medical model of psychopathology, in which the clinician (e.g., psychiatrist, psychologist, social worker) adheres to a standard set of procedures and administers a battery of assessments designed to identify symptoms in an effort to arrive at a formal diagnosis (McManus, 1992). Diagnosed symptoms and disorders are then matched to particular treatments as determined by both the psychotherapy outcomes literature (e.g., randomized controlled trials) and the clinician's extensive training and experiences. Although this particular approach has the ability to more efficiently match available resources to client needs, limitations include, most notably, that it may be overly restrictive (McGee & Mee-Lee, 1997). In fact, strict adherents to such an approach may inadvertently conceptualize clients as passive, and appear to have omitted one very important element essential to prognosis—the client's personal theory of change.

When operating from a client-directed perspective, however, clients are encouraged to be an active, collaborative participant in their treatment and serve an integral role in the formulation of their treatment plan (Hubble, Duncan, & Miller, 1999). Specifically, this collaborative approach should extend beyond simply including the client in the development of their treatment plan to an ongoing process present at the outset of each session and continuing throughout the duration of treatment. Given that a client-directed approach considers the client's thoughts and ideas most important, time should be allocated to jointly set the agenda, agreeing on the topics to be discussed each session. Thus, the client's concerns are solicited and discussed prior to those of the clinician. After exploring and attending to the client's thoughts and concerns, the clinician may proceed with offering his or her own reflections and observations in response. Further, when working from a client-directed perspective, a skilled clinician will not only respond to the client's thoughts, but will build on the client's ideas in an effort to work together and collaboratively create a better, more useful understanding of the client. This pattern of having the clinician first attend to the client's needs before offering advice or direction should occur across all areas of the client's treatment including decisions regarding length of treatment and an action plan that may be carried out between sessions.

Although it is of paramount importance that clients maintain an active role in their treatment, the clinician's training and experience in creating appropriate individualized treatment plans should not be diminished. That is, when working from a client-directed perspective, the clinician is best suited to put into practice the extensive research findings

from outcomes research on treatment compliance (i.e., ideas and plans generated by clients are those most likely to be followed and ultimately bring about change; Hubble et al., 1999; Duncan & Miller, 2000b). However, as noted previously, this approach may not be appropriate in the context of treatment with clients experiencing symptoms of severe mental illness (e.g., delusions, hallucinations). Finally, by including the client as an active, collaborative participant in their own treatment via the encouragement of client reflection and planning, the client may develop an increased level of self-efficacy, recognizing their central role in any therapeutic change (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

The Utilization of Measures of Treatment Process and Outcome

The third element described by Miller, Duncan, and Hubble (2002) relates to the ongoing routine assessment and feedback derived from reliable and valid measures of the client's progress. Indicators of progress may include both outcome and process measures. When clinicians administer such measures on a routine basis (e.g., weekly, bi-weekly), they are afforded with the opportunity to create a more collaborative and effective alliance with their clients (Saggese, 2005). That is, routine monitoring of client outcomes provide clinicians with the empirical means to accurately identify not only those clients evidencing favorable treatment response, but also clients that may not be responding as well to the selected treatment (Howard et al., 1996). The latter group is of particular interest to clinicians working from an outcome-informed perspective given that adjustments to the treatment plan may be indicated for these clients. That is, working from an outcome-informed approach allows clinicians to shift perspectives and interventions to best suit the clinical needs of their clients.

Utilization of standardized measures in the context of an outcome-informed approach to psychotherapy allows clinicians to predict with a high degree of accuracy the value of their services and continuity of care. In fact, the main objectives of any outcome-informed treatment approach should be to document the overall effectiveness of treatment, decrease dropout rates, and increase client satisfaction (Saggese, 2005). Finally, it is important to note that in addition to creating a collaborative and accountable alliance, clients asked to routinely provide feedback on process and outcome via formal assessment instruments have been found to experience a twofold increase with respect to the effectiveness of psychotherapy (Lambert et al., 2003). Two such instruments that may be used for this purpose include the Outcome Rating Scale (ORS; Miller & Duncan, 2000b) and the Session Rating Scale 3.0 (SRS; Johnson, Miller, & Duncan, 2000). Collectively, the ORS and the SRS are employed in the Partners for Change Outcome Management System (PCOMS; Miller, Duncan, Sorrell, & Brown, 2005), which is a client feedback program designed to improve treatment outcomes among clients participating in a behavioral health care intervention.

Measures. Both the ORS and the SRS are brief, 4-item visual analogue scales that may be used in the context of a CDOI approach. A visual analogue scale is a measurement instrument that attempts to quantify a particular characteristic or attitude that is believed to lie on a continuum of values and cannot be directly measured. In the context of psychotherapy, there appear to be two basic types of outcomes of interest to clinicians: clinical and treatment process. As described by Miller and Duncan (2000b), measures of clinical outcome inform clinicians regarding how they are doing, while measures of treatment process provide clinicians with feedback regarding what they actually did to obtain a particular result.

The first scale is the ORS and may be considered an indicator of clinical outcome. The ORS is to be administered at the outset of every treatment session to assess the relative progress that a client has made since his or her last session. Each ORS item covers a separate domain of functioning commonly used to assess client change in the context of psychotherapy treatment (i.e., individual, interpersonal, social, and overall functioning). As noted earlier, the benefits of beginning each treatment session with an allotted time slot for the client to describe any concerns or issues are twofold; it provides the clinician with useful information to determine whether any external or environmental influences may have impeded or enhanced the client's progress, and it allows the client to become a more active participant in the treatment

plan and recognize his or her central role in any therapeutic change.

The second scale is the SRS and may be considered an indicator of treatment process. The SRS is to be administered at the completion of every treatment session to assess the client's overall experience with that particular session. The SRS assesses the client's perceived satisfaction in four areas (i.e., relationship, goals and topics, approach or method, and overall satisfaction). Similar to the ORS, the SRS provides important clinical data, which may be of interest to both the clinician and the client (Reese et al., 2009). Routine administration of the SRS provides the clinician with an opportunity to evaluate the current treatment plan and determine whether tailoring the plan would be more prudent for the client in better achieving positive change. Additionally, the client benefits from being afforded an opportunity to voice any concerns he or she may have regarding that particular session and further reinforces the collaborative nature of the client's treatment. For example, should a client rate that he or she did not feel "heard" following a particular treatment session, the clinician may modify the selected treatment method in light of the provided feedback. Low session ratings from the client's perspective also afford the clinician with an opportunity to generate hypotheses regarding the potential mechanisms responsible for the client's negative perception of his or her treatment session experience (e.g., clinician characteristics, specific techniques or model utilized).

In terms of the empirical support for the psychometric properties of the ORS and SRS, both scales have been used as global measures of distress and alliance, respectively, among clinical and non-clinical populations and have evinced adequate construct validity with longer measures purported to assess similar constructs (Bringhurst, Watson, Miller, & Duncan, 2006; Campbell & Hemsley, 2009; Duncan et al., 2003; Duncan, Sparks, Miller, Bohanske, & Claud, 2006; Miller, Duncan, Brown, Sparks, & Claud, 2003). Internal consistency reliability estimates of the four items comprising each of the scales have yielded Cronbach's alphas ranging from .90-.93 for the ORS and from .88-.93 for the SRS (Campbell & Hemsley, 2009; Duncan et al., 2003; Miller et al., 2003), which are above the acceptable range in regard to Nunnally's (1978) established benchmark of a minimum level of .70. Thus, the reported Cronbach's alphas for each scale evidence a high level of interrelatedness among the items and suggest that the individual items appear to measure a common, underlying construct.

It is also important to note that the ORS and SRS are both highly subjective. As such, these scales are of most value when examining change within clients—a critical component of any outcome-informed approach, irrespective of treatment modality or theoretical orientation. However, caution is warranted in comparing across individual clients or specific subgroups of clients. Considering that the items comprising the ORS and SRS are readily accessible, and the estimated administration time and financial costs associated with implementing the scales are minimal, routine monitoring of treatment process and clinical outcomes can be both feasible and economical.

Conclusion

Considerable research supports the view that nearly all active psychotherapy treatments are more similar than different, and that differences in outcomes derived from comparisons of various treatment modalities are minimal (e.g., Luborsky et al., 2002; Smith & Glass, 1977; Smith et al., 1980; Stevens et al., 2000; Stiles et al., 1986; Wampold et al., 1997). This relatively new era of investigation into the pervasive influence of shared variables across psychotherapy treatments on clinical outcomes has led to the value of highlighting the common therapeutic factors found to account for client improvement. Previous research has demonstrated that only 15% of outcome variance may be attributed to specific models and techniques (Assay & Lambert, 1999). Furthermore, the client is arguably the only element held constant in the context of all psychotherapies (Bohart, 2000) and is regarded as the most powerful contributor to favorable treatment outcome (Miller et al., 1997). Thus, working from a client-directed perspective, which involves an enhancement of factors across theories that account for client change, is defensible.

Incorporation of ongoing routine assessment and feedback derived from reliable and valid measures of the client's progress is essential in the context

of outcome-informed work. Previous research has documented that two such measures, the ORS and SRS, appear to possess adequate psychometric properties (e.g., Bringhurst et al., 2006) and provide convincing support for the adoption of both scales in routine clinical practice (Anker et al., 2009; Reese et al., 2009). The administration of measures of treatment process and clinical outcomes has been identified as an effective method to enhance psychotherapy outcome and lends itself well to a CDOI approach. However, the opportunity to cultivate and maintain a strong therapeutic alliance may not be realized if such procedures are not properly implemented.

That is, some clinicians may be reluctant to administer both process and outcome measures during each treatment session due to time, effort, and cost concerns associated with a routine monitoring system. However, the required time and effort to administer such measures are minimal, and can be both feasible and economical. Additionally, if such measures are not administered on a consistent basis (e.g., weekly or bi-weekly), some clients may fail to appreciate the value of such a practice, which could potentially lead to clients believing they are not being "heard" (Lambert & Cattani, 2012; Shimokawa, Lambert, & Smart, 2010). Variable administration may also contribute to the client's perception that the data derived from such measures are irrelevant and that the measures themselves serve limited clinical value. In this instance, it is imperative for clinicians to first provide adequate rationale for the clinical utility of incorporating such measures into the client's treatment, and employ a careful, tactful approach in their presentation of the importance of using such a feedback system. In other words, clinicians are advised to spend ample time at the outset of treatment in an effort to avoid potential obstacles to the formation of a strong therapeutic bond later on in the treatment process due to inconsistent practices.

Together, tailoring psychotherapy in such a way that enhances the identified factors across theories that account for client change, and includes the routine administration of both process and outcome measures to inform and guide clinical practice, constitutes a CDOI approach. In light of the aforementioned potential limitations of a CDOI perspective, the relative benefits appear to outweigh the associated costs of adopting and implementing a CDOI approach. If clinicians aspire to best meet the individual needs of the clients they serve and achieve successful outcomes, working from both a client-directed and outcome-informed perspective appears to be a requisite for such efforts.

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The Influence of Gender, Anxiety and Food Cravings on Alcohol Use within a University Population

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The present study aimed to investigate the effect of gender, anxiety and food cravings on alcohol use within a university population. University students (N = 150) completed a survey containing a demographic questionnaire, the Alcohol Use Disorders Identification Test, the State Trait Anxiety Inventory and the Food Cravings Inventory. Results revealed gender was a significant predictor of alcohol use in university students, with males reporting greater levels of alcohol consumption than females. Food cravings were also observed to be a significant predictor of alcohol use in university students, independent of gender. Unexpectedly, state and trait anxiety failed to significantly predict alcohol use in the current sample. Results of the study are in line with empirical literature, social incentive and expectancy theories of alcohol use. Overall, our findings tentatively suggest a link between alcohol use and food cravings, which may assist in the development of more effective treatments for alcohol use disorders and eating disorders in university students.

Keywords: alcohol use, student, gender, food cravings, anxiety

Increasing levels of alcohol consumption and the subsequent manifestation of alcohol-related disorders are common features in university settings (Karam, Maalouf, & Ghandour, 2004; Norberg, Norton, Olivier & Zvolensky, 2010; Wicki, Kuntsche, & Gmel, 2010). According to the Substance Abuse and Mental Health Services Administration (2012), 60.8% of university students reported alcohol use within the past month, with 61.5% reporting intoxication at least once in the past year and 42.4% reporting intoxication in the previous month (Johnson, O'Malley, Bachman, & Schulenberg, 2010). University students have been shown to consume dangerous quantities of alcohol in comparison to other community populations, often resulting in excessive consumption and alcohol-related problems irrespective of socio-cultural consequences, in addition to alcohol dependence which involves a physiological reliance on the substance leading to tolerance and withdrawal symptoms in the absence of the substance (Nolen-Hoeksema, 2004; Wicki et al., 2010). Previous research has indicated approximately 37 to 44% of university/college students reported engagement in binge drinking at least once in the past two weeks to a month (defined as more than 7 standard drinks a night for men and more than 5 standard drinks for women; Hingson, Heeren, Winter, & Wechsler, 2005; Johnson et al., 2010; Wechsler et al., 2002).

Excessive alcohol consumption and binge drinking create numerous adverse health and personal consequences (e.g., involvement in risky sexual situations, dangerous driving, unpleasant physiological and psychological aftereffects, violence, and aggression) and has been reported as a primary cause of injury and death among university students (Wicki et al., 2010). Alcohol consumption increases risk of accidental and violent injury (National Health and Medical Research Council, 2009), and young adults with poor mental health are more likely to initiate alcohol use in adolescence, report drinking frequently and drink with the intent to get drunk (Weitzman & Nelson , 2004; Windle & Windle, 2004). By examining patterns of alcohol use and predictors of heightened alcohol consumption in a university setting and the subsequent factors that promote and maintain drinking behaviors, it may be possible to educate members of this sub-group about safer alcohol-related practices, and develop early interventions (Wicki et al., 2010).

Theories of alcohol use

Several models explaining alcohol consumption are present within the literature, focusing on cognitive, biological and motivational factors (Skinner & Aubin, 2010); however, no single model has the ability to adequately explain alcohol use, therefore multiple viewpoints must be considered to provide a comprehensive understanding of the behavior. Three models that are particularly relevant in understanding alcohol use behaviors include incentive theory (which stems from classical conditioning; Skinner & Aubin, 2010), motivational theory (Skinner & Aubin, 2010), and outcome expectancy theory (derived from cognitive origins; Jones, Corbin & Fromme, 2001). According to incentive theory, alcohol use becomes an automatic behavior for some individuals with paired associations to particular stimuli related to drinking (e.g., a bar). A key component of this theory is the individual's memory of the pleasure gained from alcohol use (positive reinforcement, which occurs when an event or stimulus is presented as a consequence of a behavior and the behavior increases), which may contribute to physiological and psychological urges that encourage them to engage in the desired behavior in order to reap the benefits. Exploring alcohol use from a classical conditioning perspective will aid in understanding how individuals develop associations between alcohol-related stimuli and behaviors, and how reward and reinforcement are key instigators of drinking (Skinner & Aubin, 2010).

According to the motivational model, an individual's motivations are driving factors in alcohol consumption, which is often triggered by expectations, physiological needs, and memories or reinforcement that alcohol may have provided previously. In particular, an individual's desired emotional state is believed to influence his/her motivation to consume alcohol, and consumption occurs when the perceived benefit of a positive emotional state (created by alcohol) outweighs the outcomes associated with abstinence, motivating the individual to engage in alcohol use.

Similar to the motivational model of alcohol use, expectancy theory proposes expectations of behavioral outcomes to influence the performance of such behaviors. In relation to alcohol, it is suggested an individual may possess expectations about the consequences of alcohol consumption (positive or negative). Positive expectations (e.g., pleasure or relaxation) serve to reinforce an individual's desire to consume alcohol, whereas negative expectations (e.g., anticipation of unpleasant physiological aftereffects) may motivate the individual to abstain from drinking (Skinner & Aubin, 2010). These alcohol expectancies are subsequently retained in long-term memory and recalled during future alcohol consumption situations (Jones et al., 2001). However, unlike the motivational model, which suggests the individual is actively involved in the decision-making process surrounding alcohol consumption, incentive theory proposes alcohol use is essentially an unconscious reaction to environmental stimuli (Skinner & Aubin, 2010).

Gender and alcohol use

Alcohol use prevalence rates differ significantly between men and women in the general community (Wicki et al., 2010). It has consistently been demonstrated males consume more alcohol, and at more hazardous and harmful levels, than their female counterparts, when controlling for body size and weight (Schulte et al., 2009; Wicki et al., 2010). Schulte, Ramo and Brown (2009) report that despite the equal distribution of risk factors for both genders, men are more likely to possess vulnerabilities that lead to the development of an alcohol-related disorder, including abuse and/or dependence. However, in recent times, the gender gap in alcohol consumption and alcohol-related problems has decreased (Nolen-Hoeksema, 2004). Heavy alcohol use and binge drinking have become increasingly commonplace in women. Yet, despite the narrowing proportions, women continue to consume significantly lower quantities and experience less alcohol-related harm than their male counterparts (Bongers et al., 1998; Nolen-Hoeksema, 2004).

Anxiety and alcohol use

Emerging research has demonstrated anxiety, particularly social anxiety, is associated with a heightened risk of experiencing alcohol-related problems; however, existing research on alcohol use and social anxiety in university students reveals inconsistent findings. Literature has suggested that

individuals experiencing anxiety (particularly related to social situations) may use substances to avoid potential criticism from substance-using peers. They may also engage in alcohol use due to perceptions or beliefs that alcohol is a common and socially acceptable means of reducing anxiety in social situations (Buckner, 2011).

Research has indicated social anxiety disorder (SAD) and alcohol use disorders (AUDs) are frequently cormorbid (see Morris, Stewart, & Ham, 2005 for a full review), with approximately 13% of adults with SAD meeting criteria for AUD, and 48.2% of adults with a lifetime history of SAD meeting criteria for an AUD (Grant et al., 2005). Both retrospective and longitudinal research have indicated when SAD and AUD co-occur, SAD typically precedes the onset of the AUD (Buckner et al., 2008a; Buckner et al., 2008b; Buckner & Turner, 2009; Falk, Yi, & Hilton, 2008). Consistent with the findings of adult samples, research has revealed that 43% of college freshmen with SAD fulfilled the diagnostic criteria for an AUD, while only 26% of college freshmen without SAD met criteria for an AUD (Kushner & Sher, 1993). However, overall, the relationship between social anxiety and alcohol use in university/college student populations has yielded mixed and inconsistent findings, according to a recent meta-analysis (Schry & White, 2013).

For example, some research has demonstrated that individuals with SAD consume significantly greater amounts of alcohol in anticipation of social interactions (Higgins & Marlatt, 1975), whereas other studies have found these individuals to consume significantly less alcohol than peers without SAD during simulated 'get-togethers' (Holroyd, 1978). Survey-based research has either failed to observe a relationship between social anxiety and alcohol consumption, or found an inverse relationship (Buckner, Schmidt, & Eggleston, 2006). Several explanations have been proposed for the lack of positive relationship between social anxiety and alcohol use in research, most notably the suggestion that socially anxious students are likely to avoid social situations and utilize alcohol only to cope with anxiety in situations that are unavoidable (Norberg, Norton, & Olivier, 2009). Similarly, despite the negative relationship (or absence of a relationship) between social anxiety and alcohol use, numerous studies have indicated anxiety is positively associated with alcohol-related problems (Buckner, Ecker, & Proctor, 2011). This relationship between anxiety and alcohol-related problems is particularly important as AUDs are defined by the social and occupational problems resulting from alcohol use, as opposed to just the frequency and intensity of use (Buckner et al., 2006).

Food cravings and alcohol use

The term 'craving' is typically used to describe an intense desire for foods and a range of substances (both legal and illicit; Gendall, Sullivan, Joyce, Fear, & Bulik, 1997; Lafay et al., 2001; Pelchat, 2002). There is strong evidence suggesting food and drugs exhibit their effects on similar or shared neurological pathways related to pleasure and reward. Research indicates many of the same neurotransmitters are implicated in both foods cravings and cravings for various substances of abuse such as alcohol (see Pelchat, 2002, for a review).

Abstinent opiate and alcohol addicts exhibit a heightened preference for and intake of sweets and report cravings for sweet foods (Morabia et al., 1989; Weiss, 1982). Individuals suffering from alcohol dependence (where an individual is physically or psychologically dependent upon drinking alcohol) have also exhibited preference for greater concentrations of sweeteners than non-dependent individuals (Gomberg, 1995). Similarly, peak-preferred concentrations of sucrose have been shown to be significantly higher in individuals with a family history of alcohol use disorders, compared to individuals with no family history of alcohol dependence concerns (Kampov-Polevoy, Garbutt, & Janowsky, 1999), possibly suggesting a genetic basis for sweet preference and alcohol-related concerns.

Research has indicated that individuals who consume alcohol excessively and experience food cravings (defined as an intense urge to eat a specific food type, in the absence of physiological hunger) exhibit similar personality traits (Gendall, Sullivan, Joyce, Fear & Bulik, 1997; Lafay et al., 2001). A study by Gendall et al. (1997) explored the personality traits of 100 women who were experiencing food cravings. Participants were required to complete a

newly established measure of food cravings and were divided into a non-craving, mild craving, or strong craving group based on responses (Gendall et al., 1997). Results indicated women in the mild and strong craving groups scored significantly higher on novelty seeking than non-cravers. Characteristics such as sensation seeking and impulsivity have been repeatedly linked to engagement in risky behaviors, and these tendencies have also been strongly correlated with alcohol abuse (Gendall et al., 1997; Nolen-Hoeksema, 2004; Schulte et al., 2009). As both food cravings and alcohol use have been shown to originate from similar personality traits, it would be reasonable to assume individuals who report food cravings would also have a greater likelihood of problematic alcohol consumption (Nolen-Hoeksema, 2004; Schulte et al., 2009).

Literature examining links between food cravings and alcohol use in humans is scarce, revealing only a minute amount of empirical studies investigating the phenomenon. Gendall et al. (1997) examined whether women with food cravings are more prone to substance abuse than women who do not experience food cravings. Participants were asked if they had ever experienced food cravings, which were defined as "an uncontrollable desire to eat a certain food or type of food" and "a strong urge to eat a specific food" (p. 547). Those who responded negatively to all of these initial three questions were considered non-cravers. They found that those in the craving category were at increased risk of alcohol abuse/dependence, with 6% of the non-cravers, 13% of the mild cravers and 21% of the strong cravers reporting alcohol use at concerning levels (Gendall et al., 1997). More recent research examining eating disordered behaviors and substance use in female university students revealed a significant relationship between binge eating (the consumption of large quantities of food in a short period of time, typically as part of an eating disorder) and high levels of alcohol consumption. Participants in the binge only category consumed severe levels of alcohol, compared to dieting only (restricting calorie) or control (no dieting) groups (Piran & Robinson, 2006). An investigation of the relationship between food cravings and alcohol use may reveal important information in understanding alcohol use in university students. It is paramount to predict heightened alcohol consumption in order to develop early interventions for those at risk.

Study Aims

The current study aims to expand upon previous research by testing specific associations between gender, anxiety, food cravings, and the use of alcohol in university-aged individuals. Overall, the study aims to determine whether gender, anxiety and food cravings resulted in a predictive relationship with alcohol use in university students. It is hypothesised that:

1. Gender is a significant predictor of alcohol use in university students, with males reporting higher scores on the Alcohol Use Disorders Identification Test (designed to measure the severity of alcohol consumption and be an early identifier of dependence issues than females).
2. Anxiety is a significant predictor of alcohol use in university students. Specifically, higher scores on the State-Trait Anxiety Inventory (an inventory of two forms of anxiety, including the degree of anxiety one experiences at the current time, known as state anxiety, and the degree of anxiety one experiences in general terms, known as trait anxiety) would be associated with higher scores on the Alcohol Use Disorders Identification Test.
3. Food cravings are a significant predictor of alcohol use in university students. That is, higher scores on the Food Craving Inventory (designed to distinguish between actual food cravings and general consumption) should be associated with higher scores on the Alcohol Use Disorders Identification Test.

Method

Participants

A convenience sample of 164 individuals currently enrolled in tertiary education was recruited from three Australian universities. Of the 164 participants, 14 were excluded due to missing data. Participants were recruited through various sources including an information sheet on a university research board and announcements on social media websites. Potential participants were then contacted via email and provided a link to the online questionnaire.

Compensation in the form of half a course credit was offered to first and second year psychology students. All participants provided informed consent and the research was approved by the human research ethics committee at the authors' institution.

Procedure

After reading a brief explanatory statement and providing informed consent, participants were asked to complete a series of questionnaires (Alcohol Use Disorders Identification Test, State Trait Anxiety Inventory, and the Food Craving Questionnaire) designed to assess alcohol use, anxiety, and food cravings. Completion of the questionnaire took approximately 20 minutes.

Materials

Demographic questionnaire. Participants were asked to indicate their age, gender, and marital status for the purpose of describing the sample.

Alcohol Use Disorders Identification Test. The Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) is a 10-item self-report instrument that provides information regarding an individual's alcohol consumption across three domains: frequency of alcohol consumption, symptoms of dependence, and severity (Babor et al., 2001; Fleming, 1996). Questions within the instrument fall across three alcohol-related domains, including frequency of alcohol consumption (items 1-3, e.g., "How often do you have six or more drinks on one occasion?"), symptoms of dependence (items 4-6, e.g., "How often during the last year have you failed to do what was normally expected from you because of drinking?") and harmful alcohol use (items 7-10, e.g., "Have you or someone else been injured as a result of your drinking?"; Babor et al., 2001; Fleming, 1996). For items 1-8, subjects are required to indicate their response on a five point Likert scale ranging from zero to four, each with different indicators, and for items 9 and 10, on a three point Likert scale (0 = no; 2 = yes, but not in the last year; and 4 = yes, during the last year; Babor et al., 2001). Each response is calculated based on the corresponding number, which is then summed to form a total score with a maximum of 40 points (Babor et al., 2001). Scores of 8 to 15 represent moderate alcohol problems, scores of 16 to 19 represent significant alcohol issues, and scores of 20 to 40 indicate dependence on the substance (Babor et al., 2001; Fleming, 1996). The psychometric properties of the AUDIT have been confirmed across multiple studies, and reliability and validity is present across genders, age categories, cultures, and both clinical and non-clinical populations (Babor et al., 2001). In the current study, the Cronbach's alpha for the AUDIT was .81, which is consistent with the alpha level found in previous studies. Test-retest reliability is also high, with a study on low-risk drinkers and alcoholics demonstrating a correlation of r = .86 from the original test to re-test (Babor et al., 2001).

State Trait Anxiety Inventory. The State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Luschens, 1970) is a 40-item self-report inventory assessing two forms of anxiety (20 items each): state anxiety, defined as situation specific anxiety that is fluctuating in nature, and trait anxiety, or dispositional anxiety (Bieling, Antony & Swinson, 1998; Kabacoff, Segal, Hersen, & Van Hasselt, 1997). Participants were asked to respond to each item on either a four-point Likert scale, in the case of the state anxiety scale, or a four-point intensity scale, in the case of trait anxiety. The psychometric properties of the STAI have been evaluated throughout the literature, with evidenced support for the instrument's validity and reliability (Kabacoff et al., 1997; Vitasari et al., 2011). In the current study, the Cronbach's alpha for the STAI was .96 across all 40 items, .94 for the state subscale and .92 for the trait subscale, indicating a very high level of internal consistency, which is in line with previous studies.

Food Craving Inventory. The Food Craving Inventory (FCI; White, Whisenhut, Williamson, Greenway, & Netemeyer, 2002) is a 37-item self-report scale, designed to measure cravings for general and specific food types experienced over the past 30 days. Participants were asked to respond to each item on a five- point Likert scale (0 = never to 4 = always/almost every day). The FCI contains four subscales including High Fats (e.g., bacon and fried fish), Sweets (e.g., brownies and ice-cream), Carbohydrates/Starches (e.g., sandwich bread, baked

Table 1

*Summary of intercorrelations, uncentered means, and standard deviations for total AUDIT, total STAI –State, Total STAI –Trait, and Total FCI (*N = *150).*

Variable	1	2	3	4	*M*	*SD*
1. AUDIT	–				6.25	5.10
2. STAI – State	.06	–			38.93	11.45
3. STAI – Trait	-.04	.82***	–		41.17	11.47
4. FCI	.20*	.17*	.12	–	55.06	14.78

Note. AUDIT = Alcohol Use Disorders Identification Test; STAI = State Trait Anxiety Inventory, FCI = Food Craving Inventory.
*p < .05. **p <. 01. ***p < .001

potato, and pasta) and Fast Food Fats (e.g., pizza and french fries). Higher scores on each subscale were indicative of greater intensity of cravings for the particular food type. Adding the scores from all four sub-categories also reveals a total score, which represents general cravings, with higher scores indicating more severe cravings (Martin et al., 2006; Martin et al., 2008; White & Grilo, 2005; White et al., 2002).

Design

The present study utilised a correlational design. Gender, food cravings (measured via the FCI), and anxiety (measured via the STAI) served as the predictor variables for the study, while alcohol use (measured via the AUDIT) served as the outcome/ criterion variable.

Results

The data were analysed using SPSS version 20. An alpha level of .05 was utilized to determine the statistical significance of all results.

Data cleaning

Data cleaning revealed 14 cases of extensive missing data, therefore these cases were removed from the data set. The final sample consisted of 150 university students, which exceeded G*Power requirements (a tool to compute statistical power analyses for many different tests) of at least 89 participants to detect a medium effect (Faul, Erdfelder, Buchner, & Lang, 2009).

Participant Data

The final sample consisted of 150 university students aged 18 to 60 years, with 40.7% (n = 61) in the 18 to 25 age category, 28% (n = 42) in the 26 to 35 age category, 19.3% (n = 29) in the 36 to 45 age category, 8.7% (n = 13) in the 46 to 55 age category, and 3.3% (n = 5) in the 56 to 60 age category. Males accounted for 24% of the total sample (n = 36), and females accounted for the remaining 76% of the sample (n = 114). Participants also varied in relation to marital status, with 61.3% (n = 92) having never married, 26.7% (n = 40) being married, 8% (n = 12) being divorced, 2.7% (n = 4) being separated and 1.3% (n = 2) being widowed.

Preliminary analyses

An independent samples t-test was conducted to determine whether significant differences on the AUDIT were observed between genders. Results revealed a significant difference between males and females, with males (M = 8.36, SD = 5.91) obtaining higher scores on the AUDIT than females (M = 5.58, SD = 4.64), $t(148) = 2.93$, $p = .004$.

Pearson product-moment correlations were also performed to examine the simple relationships between the variables of interest. Table 1 demonstrates the correlations amongst the key variables of interest. In line with expectations, a significant positive correlation existed between the FCI and AUDIT, indicating higher scores on the FCI were related to higher scores on the AUDIT. Contrary to expectations, the correlations between state and trait anxiety (STAI) with the AUDIT were both non-significant.

Main analysis

A hierarchical multiple regression analysis was performed to determine whether alcohol use could be predicted by gender, anxiety and food cravings. Age was statistically controlled via first entry into the model, with the predictor variables for subsequent blocks being entered according to theoretical importance (Tabachnick & Fidell, 2007). Age was entered on Step 1, Gender was entered on Step 2, STAI State and Trait Anxiety were entered on Step 3, and food cravings (FCI) was entered on Step 4. STAI (state and trait) and FCI were mean centred prior to entry in the regression equation. Table 2 highlights the results from the hierarchical multiple regression analysis.

As can be seen in Table 2, approximately 24% of the variance in alcohol use was accounted for after all variables were entered into the regression equation $F(8, 141) = 5.45$, $p < .001$. On Step 1, age accounted for a significant 12% of the variance in alcohol use scores $R^2 = .12$, F_{change} (4, 145) = 4.85, $p = .001$. Therefore, age was a significant predictor of alcohol use. Alcohol use scores were 3.48 points lower ($p < .001$) in the 26 to 35 years age bracket compared to 18 to 25 year olds (reference group), 3.25 points lower ($p = .004$) in the 36 to 45 years age bracket compared to 18 to 25 year olds, 2.32 points lower ($p = .119$) in the 46 to 55 years age bracket compared to 18 to 25 year olds, and 5.85 points lower ($p = .011$) in the 56 to 60 years age bracket compared to 18 to 25 year olds.

After controlling for the effect of age, gender was entered on Step 2 and accounted for an additional 8% of the variance in alcohol use scores $\Delta R^2 = .08$, $F(1, 144) = 13.90$, $p < .001$. Therefore, at its point of entry into the model, gender was a significant predictor of alcohol use, with total AUDIT scores 3.38 points lower ($p < .001$) in females compared to males (reference group). On Step 3 of the analysis, state and trait anxiety account for a non-significant 2% of the variance in alcohol use $\Delta R^2 = .02$, $F = (2, 142) = 1.64$, $p = .198$. Therefore, at their point of entry into the model, state anxiety and trait anxiety were not significant predictors of alcohol use.

When Total FCI Score was entered on Step 4, an additional 2.3% of the variance in alcohol use was accounted for by food cravings, over and above the variance accounted for by age, gender and state and trait anxiety. This increase in variance was significant, $F = (1, 141) = 4.16$, $p = .043$, meaning that at its point of entry, food cravings were a significant predictor of alcohol use, with higher scores on food cravings related to higher scores on alcohol use. After all variables were entered into the regression equation on Step 4, only age (excluding 46-55 years), gender, and food cravings were significant predictors of alcohol use. With regards to unique variance, age contributed a total of 15.8% unique variance to alcohol use, gender contributed 8.4% unique variance to alcohol use, whilst food cravings contributed 2.3% unique variance to alcohol use.

Discussion

The present study contributes to the growing body of literature investigating factors associated with alcohol use in university populations. The results, which partially supported hypotheses, indicated age and gender were significant predictors of alcohol use in university students, with males reporting significantly higher scores on the AUDIT than females, and all age groups (excluding the 46-55 age bracket) reporting significantly greater alcohol use than 18 to 25 year olds. This finding is consistent with previous empirical literature, which has repeatedly highlighted increased alcohol consumption and alcohol-related problems including abuse and dependence in males (Schulte et al., 2009; Wicki et al., 2010). Although previous research has noted a decreasing gender gap in alcohol consumption and alcohol-related problems (Nolen-Hoeksema, 2004), our findings support the notion that females continue to consume significantly lower quantities of alcohol and are at lower risk of alcohol-related harm than males (Bongers et al., 1998; Nolen-Hoeksema, 2004). Similarly, our findings echo results of previous research, which has demonstrated a greater consumption of alcohol in young adults (18 to 24 years), decreasing as individual's age, with lowest consumption in individuals over 60 years of age (Eigenbrodt et al., 2001).

Results diverged from expectations when considering the predictive relationship of anxiety on alcohol use. In the current study, both state and trait anxiety failed to significantly predict alcohol use in university students. These results are not entirely surprising since the literature has demonstrated

Table 2

Hierarchical multiple regression analyses predicting alcohol use from gender, state, and trait anxiety and food cravings in a university population.

Predictor	ΔR^2	β	*B*	*SE B*	95% CI for *B*	sr^2
Step 1	.12**					
Constant			8.25	.62	[7.07, 9.47]	
Age (26–35)		-.31***	-3.48	.97	[-5.41, -1.56]	-.28
Age (36–45)		-.26**	-3.25	1.10	[5.41, -1.08]	-.23
Age (46–55)		-.13	-2.32	1.48	[-5.25, .61]	-.12
Age (56–60)		-.21*	-5.84	2.26	[-10.31, -1.38]	-.20
Step 2	.08***					
Constant			10.96	.94	[9.10, 12.82]	
Gender (female)		-.28***	-3.38	.91	[-5.17, -1.59]	-.28
Step 3	.02					
Constant			10.14	1.61	[6.96, 13.32]	
State Anxiety		-.23	.10	.06	[-.01, .22]	.13
Trait Anxiety		-.18	-.08	.06	[-.19, .04]	-.10
Step 4	.02*					
Constant			7.42	2.07	[3.34, 11.52]	
Food Cravings		.16*	.05	.03	[.01, .11]	.15
Total R^2 = .24***						

Note. N =150. CI = confidence interval. *p < .05. **p < .01. ***p < .001.

inconsistent and mixed findings across studies. Numerous explanations for these mixed findings have been proposed, mostly related to suggesting individuals with anxiety should only consume alcohol in social situations they cannot avoid. However, it is also likely that anxious individuals, particularly those with social anxiety, consume just enough alcohol to reduce their anxiety, but may consciously decide to moderate consumption, knowing alcohol may negatively affect their social performance. It is also likely that the results were affected by the context of measurement. That is, even though individuals with anxiety may consume alcohol to reduce their anxiety (representing a coping mechanism), the quantity consumed may not appear elevated compared to the respective sample (university students), where heavy alcohol use is common and considered normal.

Results of the current study also revealed food cravings predicted alcohol use in a university population, with post hoc analyses demonstrating higher food craving scores were related to higher scores on the AUDIT. These results represent a novel contribution to research, given the paucity of literature investigating food cravings and alcohol use in any population (community or university students). These results are, however, consistent with suggestions that the association between food craving and alcohol use could be due to shared personality traits (e.g., impulsive tendencies and sensation seeking) that exist within individuals and are, in part, causes for both the cravings of food and alcohol (Gendall et al., 1997; Nolen-Hoeksema, 2004; Schulte et al., 2009). This relationship is also supported by the small body of empirical literature available, which indicates individuals who engage in binge eating behaviors consume elevated levels of alcohol and are at greater risk of alcohol-related abuse in comparison to those without disordered eating patterns (Gendall et al., 1997; Piran & Robinson, 2006).

These findings are also consistent with previous theoretical models (e.g., expectancy theory and social incentive theory) that have been applied in understanding alcohol use. Our results suggest food craving mechanisms can be explained using these

models, particularly the role of positive reinforcement and memory of pleasurable consequences, increasing the likelihood of consuming or craving a particular food type in future situations. Similar to the conditioning effects of alcohol use, due to opponent processes and incentive salience, food cravings have also been shown to occur in the absence of homeostatic disturbance (i.e., nutritional deficit) and can be triggered by salient environmental stimuli (Pelchat, 2002). Food cravings can be triggered by the sight, smell, or imagery of the craved food; however they can also be triggered by associated stimuli (e.g., visual images of bakeries, similar to bars).

Although outside the context of the current study, it is also possible our findings provide support for the shared pathways and similar mechanisms of action between food cravings and drug cravings hypothesised in research. However, as in any correlation design, the causative relationship of food cravings in alcohol use cannot be determined and future research utilizing experimental studies is required to clarify the nature of the relationship.

Limitations and Direction for Future Research

Although the current study has several strengths, including the novel association between food cravings and alcohol use observed, certain limitations are noted. First, a main limitation of the current study was the use of university students, primarily from a single university, which limited the generalizability of results to other populations and samples of university students (Mitchell & Jolley, 2010). However, given the high prevalence of alcohol use in university populations, findings of the current study are nonetheless relevant to understanding alcohol-related behaviors (Wicki et al., 2010). Second, as a result of uneven gender composition (114 females vs. 36 males), it is likely males were underrepresented in the sample and a true understanding of male alcohol use in university students was not obtained. Despite this limitation, significant results were still revealed. Future research should attempt to rectify these sampling limitations by employing a more gender-balanced sample, utilizing random sampling from a range of universities.

As in any research that utilizes self-report measures, it is possibly results were influenced by social desirability concerns. Therefore future research would benefit from including a social desirability scale, particularly given the sensitivity of topics studied (e.g., anxiety, frequency of alcohol use, presence of food cravings). Similarly, although the majority of research investigating anxiety and alcohol use in university students has focused on social anxiety, the anxiety measure employed in the current study did not measure constructs of social anxiety, which may explain some of the non-significant findings. Future research would benefit from employing a psychometric instrument sensitive to social anxiety. It would also be of use for future research to examine specific types of food cravings (e.g., sweet versus savory) to provide a greater understanding of the association between food cravings and alcohol use, particularly given previous research has indicated a preference for sweet tastes in individuals with alcohol use disorders. Inclusion of a diagnostic instrument to measure binge eating (and potentially identify binge eating disorder) would also be useful to examine the relationships between food cravings, binge eating disorder, and alcohol use.

Concluding Remarks

Overall, the current research has contributed to the growing body of literature surrounding alcohol use in university students by examining the specific impact of gender, anxiety, and food cravings on alcohol use in a community, as opposed to a clinical, sample. While certain limitations are noted, both gender and food cravings were shown to significantly predict alcohol use in a sample of university students. The predictive relationship of food cravings on alcohol use represents a novel contribution to research and is in line with previous theoretical models (e.g., social incentive theory and expectancy theory), which highlight the motivational process of positive reinforcement and environmental stimuli as craving triggers.

While future research is required, our findings tentatively suggest a link between alcohol and food cravings, which may assist in the development of more effective treatments for AUDs and eating disorders in university students. Educational institutions and policy makers should educate university students about the factors that potentially promote and maintain drinking behaviors, and better educate

them on safer alcohol-related practices in order to reduce excessive alcohol consumption and the occurrence of alcohol-related disorders (Wicki et al., 2010). Clinicians should be mindful of the potential comorbidity between alcohol use and food cravings when treating university students, and monitor eating-related and exercise behaviors to prevent progression to an eating disorder or use of food as a pathological coping strategy.

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Religion and HIV/AIDS Stigma: Considerations for the Nursing Profession

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Nurses' stigmatization of people living with HIV/AIDS hinders effective health care provisions for this sector of the population. Scientific literature on HIV/AIDS stigma has emphasized cognitive, individual, and interpersonal factors that are relevant to the understanding of the stigmatization process among health care professionals (e.g. a health care professional's accuracy in knowledge of the workings of the virus, effectiveness of emotion management, degree of proximity to the stigmatized group, etc.). However, researchers have also examined the socio-structural factors underlying stigma, and religion has consequently emerged as a social phenomenon that may foster it. The role of religion among professional nurses who specifically service people living with HIV/AIDS remains understudied. Focusing on evidence-based literature, we discuss the relationship between religion and HIV/AIDS stigma, explore potential implications of this relationship for the nursing profession, and make recommendations for stigma-reducing interventions.

Keywords: religion, HIV/AIDS, stigma, nursing

Research addressing the role of religious beliefs in interventions of nurses within clinical scenarios has increased in the past decade (Flannelly, Flannelly, & Weaver, 2002; Fowler, 2009; Reimer-Kirkham, 2009). Scientific literature has evidenced the positive implications of religious beliefs among nurses in professional interventions, such as the enhancement of abilities to provide spiritual care for patients who need it and to foster healthy behaviors in patients (Taylor, 2003; Williamson & Kautz, 2009). Nevertheless, recent scientific literature has also documented the necessity for health professionals to be able to tend to potentially negative outcomes of religious beliefs among people living with HIV/AIDS (PLWHA), such as adverse coping skills and internal struggles resulting from strict religious mandates (Pargament, Murray-Swank, Magyar, & Ano, 2005). In spite of this research, however, little is known about the potential implications of religious beliefs among nurses who provide direct health services to PLWHA.

Researchers have used the traditional definition of stigma as "an attribute that is deeply discrediting" (Goffman, 1963, p. 3). Since this conceptualization of stigma was introduced, investigators have highlighted that stigma functions as an interrelation between individual and social phenomena, resulting in both felt and social manifestations (Jiménez et al., 2010; Rintamaki, Davis, Bennett, Skripkauskas, & Wolf, 2006). Researchers have identified religious beliefs (e.g. beliefs of Catholic, Lutheran and Pentecostal churches) as factors that underlie the process of stigmatization toward PLWHA (Parker & Birdsall, 2005; Zou et al., 2009). Consequently, strongly held religious beliefs have the potential to interfere in the provision of quality health services to this population.

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Although little is known about how personal religious beliefs influence nurses' stigmatizing attitudes toward PLWHA, research on sample populations of healthcare providers has identified adherence to religion as a pivotal component underlying this process of stigmatization (Andrewin & Chien, 2008; Varas-Díaz, Neilands, Rivera Malavé, & Betancourt, 2010). Potential outcomes linked with this process include negative nurse-patient relationships, denial of services, and conceptualizations of patients' illnesses as consequences of individual behaviors that violate moral codes in the context of Christian beliefs (Chitando & Gunda, 2007; Taylor & Carr, 2009). These scenarios represent potential implications on the delivery of healthcare services that researchers and health professionals must address. In this article we discuss evidence-based literature in order to address how religious beliefs may foster HIV/AIDS stigma manifestations among nursing professionals. We also provide recommendations for future research and stigma-reducing interventions.

HIV/AIDS and Nursing Care

HIV/AIDS continues to be a global epidemic of an alarming magnitude. UNAIDS (2012) reported that more than thirty million people live with HIV worldwide. In the United States alone, more than forty thousand people were diagnosed with HIV in 2010 (Center for Disease Control and Prevention, 2012). Nurses are at the forefront of service delivery to PLWHA, especially in the areas of prevention, care, and treatment (Relf et al., 2011). In 2007, the National HIV Nurses Association (NHIVNA) identified the personal intervention of nurses as playing a crucial role in the assessment of patients' conditions and the development of care plans related to their physical, social, psychological, and spiritual needs. High-quality interventions potentially improve the adherence of PLWHA to HIV/AIDS treatment (e.g. taking pills on time; Venkatesh et al., 2010). Adherence to treatment can have a significantly positive impact on the well-being of PLWHA, such as improving social support and decreasing depressive symptoms (Wang et al., 2010).

Nurses represent a large number of health professionals in constant interaction with doctors, family, and friends of PLWHA. This makes them an important group that can potentially advocate for the well-being of PLWHA (Vance & Denham, 2008). Nevertheless, stigma toward PLWHA among health professionals represents one of the central barriers to effective prevention and health care (Armstrong, 2003). Nurses are often called to address HIV/AIDS-related stigma (or HIV/AIDS stigma) in the general community as well as in health scenarios (NHIVNA, 2007; Holzemer & Uys, 2004). Therefore, it is crucial to examine how stigma constitutes an obstacle to nurses' effective service delivery and develop a clear understanding of which individual and social factors may foster stigmatizing attitudes in this context.

HIV/AIDS Stigma and Its Relationship with Religion

Since the beginning of the epidemic, HIV has been associated with religious beliefs such as moral failings and sinful behaviors. For example, during the first years of the epidemic in the 1980's, HIV infection received plenty of media attention that linked it to members of "risk groups" (e,g. homosexual men) and labeled the disease as the "gay plague" (Herek, 2014, p. 122; Malcolm et al., 1998). This historical context cemented stigmatizing notions about HIV, sexuality, and drug use which fostered the creation of laws and policies in terms that criminalized the disease. A public health crisis with profoundly detrimental consequences was prompted in large part by the persistent stigmatization of HIV/AIDS. Years later, the need to understand HIV/AIDS stigma finally became evident and gained urgency among researchers, public health officials, and health policymakers.

Recent years have witnessed an increase in the number of identified social components of stigma (e.g. cultural beliefs about homosexuality and drug use) as well as the definition of stigma as a phenomenon inseparable from the socio-historical context of HIV (Malcolm et al., 1998; Scambler, 2006, 2009). This has allowed for a deeper understanding of religious beliefs and their relationship with HIV/AIDS stigma.

Before giving an explanation of the relationship between HIV/AIDS and stigma, we must understand that the manifestation of stigma represents a hierarchical power relationship (Parker & Aggleton, 2003). Unbalanced power relationships cause

some groups to be socially devalued, producing social stigma and inequality. Parker and Aggleton's (2003) analysis of processes of social differentiation and devaluation proposed that religion represents a powerful socio-cultural phenomenon able to promote a hierarchy of values that fosters stigmatization by signaling social distinctions among individuals. For instance, many religious codes classify behaviors associated with HIV/AIDS, such as homosexuality and drug use, as being immoral, thus contributing to socially shared negative perceptions of PLWHA (Chitando & Gunda, 2007; Zou et al., 2009).

Using a conceptual framework that emphasizes the individual cognitive process in manifestations of stigma, Link and Phelan (2001) noted that stigma is present when the following components converge within a context of power: labeling, stereotyping, separation, loss of status, and discrimination. In this way, the individual is first labeled with a characteristic considered out of the norm, such as being diagnosed with HIV. Society often stereotypes PLWHA as drug users, homosexuals, promiscuous persons, or sex workers (Thi et al., 2008). During the process of stigmatization, the individual who suffers a negative stereotype is severed from the norm. In other words, a separation takes place between the so-called normal individual and the stigmatized one. As this separation occurs, the individual loses social status and suffers discrimination. As the loss-of-status component unfolds, "the person is connected to undesirable characteristics that reduce his or her status in the eyes of the stigmatizer" (Link & Phelan, 2001, p. 371). Finally, the individual who has lost his or her social status is discriminated against, and this discrimination may in turn materialize as a rejection of health services or limitation of treatment (Pickles, King, & Belan, 2009). For example, treatment can be provided with lack of empathy or even be completely denied.

Link and Phelan's (2001) framework highlighted how socio-cultural aspects are integral to stigmatization even while research continues to focus on individual cognitive processes. Therefore, conceptual frameworks used in the study of stigma, whether focused on social or cognitive processes, identify socio-structural phenomena as integral to the understanding of stigmatization, which enables a better understanding of religion as a socio-structural phenomenon that can foster HIV/AIDS stigma.

Religious beliefs may perpetuate a negative perception of PLWHA (Varas-Díaz et al., 2010). For instance, people who base their beliefs on rigid religious norms may associate HIV transmission with immorality and sinful behavior (e.g., sexual immorality, promiscuity, and drug use; Chitando & Gunda, 2007; Parker & Birdsall, 2005). Research with Catholic, Lutheran and Pentecostal churches highlighted how people still interpret HIV/AIDS as a punishment from God attaching PLWHA with immoral behaviors (Zou et al., 2009). UNAIDS (2010) identified the need for promoting strategies to reduce HIV/AIDS stigma among religious communities, echoing the concern of researchers. Nevertheless, these same religious beliefs may foster a desire to help among members of the community and health professionals (Lindley, Coleman, Gaddist, & White, 2010; Taylor & Carr, 2009; Williamson & Kautz, 2009). This apparent contradiction only serves to draw attention to the complex nature of religious belief and the myriad ways in which it can affect or even provoke HIV/AIDS stigma as well as influence any subsequent delivery of service. For example, religious beliefs among professional nurses could define and influence their work as a call to give care to others. However, these beliefs could foster HIV/AIDS stigma manifestations in an attempt to address immorality and sinful behaviors associated to HIV during the service provision.

To explain the role of religion in manifestations of HIV/AIDS stigma, we should consider the following: (1) religious moral reasoning fosters socially negative labels related to PLWHA (e.g., drug use and homosexuality; Chitando & Gunda, 2007); and (2) religious communities may stigmatize PLWHA because of their apparent connection with an alleged practice of immoral behaviors (Zou et al., 2009). Varas-Díaz (2011) previously explained the relation between religion and HIV/AIDS stigma by highlighting the role of the body. He stated that both religious and health organizations, albeit for different reasons, prescribe what is considered appropriate behavior for bodies in society. For example, the Seventh-Day Adventist Church follows conservative beliefs for specific practices related to the body, such as dress code, vegetarian diet, and monogamous-heterosexual unions[1]. Consequently, behaviors

considered moral are also deemed important for keeping oneself healthy. The resulting linkage between morality and health is often established as part of social responses to disease and can produce a perception of people who violate religious rules through their bodies as deserving of disease. This has been well documented in the case of HIV (Chitando & Gunda, 2007; Zou et al., 2009). In this way, PLWHA have presumably violated the moral fundaments of what they should do with their bodies.

Varas-Díaz (2011) identified four features of religious belief that support the manifestation of stigma: (1) stigma as an unavoidable consequence of breaking moral rules (i.e., the moral failure of PLWHA); (2) different mechanisms used by religious institutions to foster the process of stigmatization (e.g., the use of secular sources, such as health care centers, to lay blame on drug users, homosexuals, and PLWHA); (3) activities that perpetuate the moral view of stigma (e.g., the pervasive use of media, such as newspapers and television, to justify HIV/AIDS stigma); and (4) government support (i.e., the use of state-sponsored mechanisms to foster HIV/AIDS stigma). These features of religious belief help to better understand how religion may perpetuate HIV/AIDS stigma.

HIV/AIDS Stigma Among Nurses

When HIV/AIDS stigma is present among health professionals, the delivery of quality services may encounter significant barriers (Nyblade, Stangl, Weiss, & Ashburn, 2009). Researchers have documented many stigmatizing behaviors among health professionals, including nuanced looks, subtle questions, actions indicating fear, awkward verbal exchanges, and refusal to provide care (Zukoski & Thorburn, 2009). These behaviors greatly impact the mental and/or physical health of PLWHA (Nyblade et al. 2009; Thi et al., 2008).

Researchers have particularly identified stigmatizing behaviors toward PLWHA among professional nurses. Thi et al. (2008), documented stigmatizing behaviors such as verbal abuse and the limitation of health care among health professionals finding that HIV/AIDS stigma manifestations were most frequent among professional nurses, and that low-quality health care had led some PLWHA to avoid health care facilities entirely. In a study by Tyer-Viola (2007), which documented the presence of negative attitudes toward HIV-positive pregnant women, the nurse participants showed signs of prejudice and were consequently less willing to care for HIV-infected women. Another study on nurses from Nigeria (Adebajo, Bamgbala, & Oyediran, 2003) found that more than half of the participants felt that PLWHA were responsible for their illness, and 32% of the participants felt that HIV was a punishment from God.

One of the main problems of these stigmatizing behaviors is the barrier that this phenomenon represents to the access of health care by PLWHA. Researchers have documented how HIV/AIDS stigma could reduce an individual's adherence to HIV/AIDS treatment (Rivero-Méndez, Dawson-Rose, & Solís-Báez, 2010), which could in turn result in depression and a reduction in psychosocial well-being (Logie, James, Tharao, & Loutfy, 2013). Additionally, interfering with the health services of PLWHA is a restriction of those individuals' rights (Varas-Díaz, Neilands, Guilamo-Ramos, & Cintrón-Bou, 2008; Yannessa, Reece, & Basta, 2008).

Religion and Its Potential Implications for PLWHA Nursing Care

Religion in the United States defines important socio-cultural values. Koenig, McCollough, and Larson (2001) defined religion as "an organized system of beliefs, practices, rituals, and symbols designed to facilitate closeness to the sacred or transcendent (God, higher power, or ultimate truth/reality)" (p. 18). A survey by The Pew Forum on Religion and Public Life (2008) found that more than half of Americans sampled in the study say religion is very important in their lives, attend religious services regularly and pray daily.

Since religion is very important for many individuals, religion and activities associated with it (e.g., praying with patients) have become an integral part of service provision in some health scenarios (Narayanasamy & Narayanasamy, 2008). During

[1]More information can be found on the Seventh-Day Adventist Church web page (http://www.adventist.org/beliefs/#17)

the past decades, the relationship between religion and health has been extensively studied (Lee & Newberg, 2005). Researchers have highlighted the positive relationship between religion, psychological well-being, and coping strategies among chronically ill patients (Aranda, 2008; Pargament et al., 2004). However, studies have reported some potentially negative aspects of religion in health care, including abuse of power and internal religious struggles (French & Narayanasamy, 2011; Pargament et al., 2005). Reimer and Kirkham (2009) emphasize the presence and effects of religious beliefs in nurse-patient interventions, tending to highlight positive outcomes for patients in general. Still, there is scarce literature regarding the role of religion in nurses who work with highly stigmatized populations, such as PLWHA.

Andrewin and Chien (2008) found that blame and judgment were the components most often present in nurses' stigmatizing attitudes toward PLWHA. Both of these components were previously identified in this paper as parts of the moral reasoning that some religious individuals may use to stigmatize. These researchers also highlight, in a study where 84% of the participating nurses self-identified as religious, mostly Catholics and Anglican, the nonreligious participant nurses were less stigmatizing.

Varas-Díaz et al. (2010) documented the role of religion in manifestations of HIV/AIDS stigma among health professionals and highlighted the need to consider religious practices and beliefs as important factors in the study of HIV/AIDS stigma. Results demonstrated statistically significant differences between participants who took part in religious events (e.g. attending church) and participants who did not do so. Those who participated in religious events scored higher in the following aspects: (1) interpreting PLWHA as lacking in productivity; (2) believing that personal characteristics such as irresponsibility caused the infection; (3) being fearful of becoming infected in everyday social interaction; and (4) having negative emotions associated with PLWHA (shame, pity, anger, etc.). These last two studies point to the need for professional nurses to understand the role of religion in HIV/AIDS stigma and the ways in which religious beliefs and practices may underlie their conceptualizations of HIV/AIDS and their behaviors toward PLWHA.

Considerations and Recommendations for the Professional Nurse

The manifestations of stigma toward PLWHA continue to represent significant barriers to the provision of quality health care services. Understanding the factors that underlie the process of stigmatization would allow the development of effective stigma-reducing interventions. Moreover, developing stigma-reducing interventions represents an ethical issue for professional nurses. The limitation or denial of health care services by any nurse violates human dignity and makes it impossible for all patients to have health care that is "unrestricted by considerations of social or economic status, personal attributes, or the nature of health problems" (American Nurses Association, 2001, p. 1). As the code of ethics of professional nurses points out, there may be conflicts of interest between nurses' and patients' values. However, according to the American Nurses Association, "nurses strive to resolve such conflicts in ways that ensure patient safety, guard the patient interests and preserve the professional integrity of the nurses" (p. 5).

It is important to understand and address these issues in order to: (1) develop more research studies that explore the role of religion in the manifestations of HIV/AIDS stigma among nurses; (2) explore in-depth descriptions of how practicing nurses interpret the role of religion in their health service delivery practices; (3) foster more institutional research to potentially promote a deeper understanding of the implications of religion in HIV/AIDS-related stigma; and (4) provide new scientific data that might inform stigma-reducing intervention models according to varying levels of lived religiosity (e.g., frequency in attendance to church or religious meetings, amounts of time spent praying or worshiping and degree of participation in religious activities).

In relation to the practice of their profession, nurses have a crucial responsibility to implement HIV/AIDS stigma-reducing strategies in health care centers, given that they are in such a strong position to advocate for the rights of PLWHA. Additionally, nursing schools need to prepare nurses with knowledge regarding the effects of religious beliefs on health care involving PLWHA and to implement interventions addressing HIV/AIDS stigma during the formation of nursing students (e.g. Shah, Heylen, Srinivasan, Perumpil, & Ekstrand, 2014).

Discussion

The influence of religion is an important variable for the physical and emotional health of many patients. Moreover, the use of religious beliefs and practices (e.g., praying) in nurse-patient interventions has been documented as being an important factor in patient well-being. However, health professionals must be aware of the potentially harmful effects of religion on HIV/AIDS stigma when they are directly serving highly stigmatized populations, such as PLWHA. Studies on HIV/AIDS stigma have identified the religious socio-cultural phenomenon as playing an important role in manifestations of stigma. Overlooking the potential impact of religion on the development of HIV/AIDS stigma could have detrimental effects on the well-being of PLWHA, such as low adherence to treatment and poor physical and emotional health. Furthermore, nurses who are not aware of these effects risk behaving in an unethical manner while practicing their profession.

Scientific research on nursing should play a more active role in the analysis of social determinants that can foster HIV/AIDS stigma, such as religion. Although only a handful of studies have explored the role of religion in HIV/AIDS stigma manifestations among nurses, some researchers have begun to document an initial understanding of their relation. There is more work to do if professional nurses are to have an in-depth understanding of the implications of social stigma, and its linkages to their religious beliefs.

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