

**ORIGINAL PEER-REVIEWED RESEARCH***Intended Audience: Researchers, Practitioners*

# Correlating Mediums' Accuracy with Learning Styles and Sensory Modality Preferences

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**Abstract:** This study obtained novel data regarding mediums' accuracy when reporting different types of information and the relationship of accuracy to mediums' learning styles and sensory modality preferences (LS/SMPs). The medium participants in this study were 12 Windbridge Certified Research Mediums (WCRMs) who were previously screened and certified using published criteria; 11 females, 1 male; average age:  $58.9 \pm 2.4$  years. The mediums' accuracy scores when asked, under blinded conditions, specific questions about a deceased person (physical description, personality, hobbies, and cause of death) were compared. The means ( $\pm$  SE) of 21 accuracy scores for each of the four question types varied (physical description:  $53.9\% \pm 5.2\%$ ; personality:  $67.0\% \pm 7.1\%$ ; hobbies:  $49.4\% \pm 5.5\%$ ; and cause of death:  $41.3\% \pm 6.5\%$ ) but no differences requiring further statistical analysis existed. Accuracy scores were also compared to participant responses to the following LS/SMP questionnaires: the Index of Learning Styles© (ILS), the Barsch Learning Style Inventory (BLSI), and the Learning Channel Preference (LCP). Correlation analyses indicated no significant correlations between accuracy and LS/SMPs although moderate correlations between the different question types existed. Though this sample size was not large, it may be appropriate to conclude that none of the four types of information requested is more or less difficult to report during a mediumship reading than any other. This finding is consistent with mediums' descriptions of their experiences as passive perceptions and of the deceased as autonomous entities. Further, individual characteristics categorized as LS/SMPs may not impact mediumistic abilities. In addition, the multi-modal nature of mediumship would suggest that individual sensory preferences are irrelevant to accuracy. Future research may wish to explore the relationship of LS/SMPs to the anomalous acquisition of information not regularly experienced as autonomous.

**Keywords:** mediumship, accuracy, learning style, sensory modality preference, quantitative

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Experiences like those involving psi, an umbrella term for seemingly psychic phenomena not mediated by the senses or by logical inference (e.g., Bem, 2011, Cardeña, 2018), have been reported across civilizations throughout history (e.g., Moreira-Almeida & Lotufo-Neto, 2017). The study of psi phenomena provides “valuable insights into the full range of human experience” (Cardeña et al., 2017, p. 4). In an effort to further explore the mental processes of non-clinical individuals who report psi-based phenomena, this study aimed to examine the learning styles and sensory modality preferences (LS/SMPs) of individuals (termed mediums) who experience regular communication with the deceased (termed discarnates) and how their LS/SMPs relate to the accuracy of their statements collected under blinded conditions.

In *The Mediums' Book*, Kardec (1861/2009) describes varieties of mediumship including hearing mediums who can hear the voices of spirits, and seeing mediums who may be able to “describe in the smallest detail their gestures, facial expressions, the characteristic outline of their face, their clothing and even the feelings they express” (pp. 273-74). The findings from phenomenological research with contemporary mediums reflect these concepts and have been assessed using interviews, observations, and library material reviews (Emmons & Emmons, 2003), as well as Interpretative Phenomenological Analysis (IPA, Roxburgh & Roe, 2013), thematic analysis (Rock, et al., 2009), computerized text analysis (Beischel et al., 2017), and content analysis (Beischel et al., 2017) to demonstrate that mediums' experiences are multi-modal and most often include seeing, hearing, and feeling information related to the deceased.

Contemporary mediumship research has also included accuracy testing of mediums' statements under experimentally controlled conditions. Beischel et al. (2015) employed methods that addressed conventional explanations for successful mediumship readings including cold reading, rater bias, experimenter cueing, and fraud. Accuracy scoring data was collected for 58 blinded phone readings performed by 20 mediums. Statistically significant findings included: percentage of reading items scored as accurate (n=31 readings,  $p < .01$ ,  $d = 0.75$ ); global scores (n=58

readings,  $p=.001$ ,  $d=.57$ ); and forced-choice reading selections ( $n=58$  readings,  $p=.01$ ). This replication and extension study supported the existence of anomalous information reception (AIR), the reporting by mediums of accurate and specific information about the deceased without prior knowledge about the discarnates or sitters, in the absence of any sensory feedback during or after the readings, and without using deceptive means.

### **Learning Styles**

Learning styles (LSs; also called learning patterns or dimensions; Lake et al., 2017) represent habitual and characteristic cognitive, affective, and psychological preferences and behaviors that are “consistent over long periods of time and across many areas of activity” (Sternberg & Grigorenko, 2001, p. 2).

There are several popular models of learning styles, and each has associated assessment instruments. Dunn et al.'s Learning Style Inventory (1975) assesses 21 elements in five categories: psychological, environmental, emotional, sociological, and physiological. Kolb and Kolb's (2005) Learning Style Inventory assesses four learning modes: concrete experience (CE, 'feeling'), abstract conceptualization (AC, 'thinking'), reflective observation (RO, 'watching') and active experimentation (AE, 'doing'). The Index of Learning Styles© (ILS), based on the Felder and Silverman (1988) model, assesses four dichotomies: visual/verbal, active/reflective, sensing/intuitive, and sequential/global. The VARK© inventory (Fleming, 2001) assesses SMPs as being visual (V), auditory (A), reading/writing (R), or kinesthetic (K).

While the usefulness of learning style theories in educational settings may be limited (e.g., Pashler et al., 2008; Willingham et al., 2015), learning style assessments are useful in categorizing individuals based on their inherent preferences as well as quantifying those preferences. Although LS/SMPs have not been widely examined by psi researchers using these instruments, French telepathy researcher René Warcollier (1881-1962) found that agent/percipient pairs (the person 'sending' the thought and the person 'receiving' it) should ideally share the same SMP (Si Ahmed, 2017). In addition, individuals with specialist knowledge or skills like mediumistic

abilities may exhibit modality-specific processing differences similar to how musicians process auditory information (e.g., Mandikal Vasuki et al., 2016).

This study compared results from mediums' LS/SMP questionnaire responses to their accuracy scores when asked specific questions about a deceased person. Because adults' learning style preferences are consistent over time, findings from LS/SMP questionnaires completed today can appropriately be associated with previously collected accuracy data. In addition, because the mediums in this study provided accurate information about the deceased under controlled laboratory conditions, explanations such as fraud, delusion, psychosis [including subjective paranormal experience psychosis (Neppe, 1993)], or a brain disorder such as temporal lobe dysfunction (e.g., Persinger, 1983) or simply the mediums' beliefs that they are communicating with the deceased have been effectively addressed.

## Method

### Participants

The mediums in this study previously demonstrated the ability to report accurate and specific information about the deceased under various controlled laboratory conditions. They were screened and credentialed as Windbridge Certified Research Mediums (WCRMs) using published criteria (Beischel, 2007). WCRMs donate their time to laboratory research and agree to uphold specific standards of conduct. They are part of the research team and the 12 who participated in the relevant portion of the original accuracy testing were recruited for participation in the current study. The participating mediums were 11 females and 1 male; average age at time of data collection:  $58.9 \pm 2.4$  years.

### Procedure

#### *Accuracy Scores*

As cited above, Beischel et al. (2015) collected the accuracy scores given to 20 mediums during 58 readings of various formats and blinding levels including more-than-double-blind (or 'quintuple-blind') proxy-sitter phone readings for individual discarnates. The research design for these

quintuple-blind readings incorporated five levels of blinding in which the mediums (WCRMs), sitters, and experimenters were all blinded: (1) the WCRM was blinded to information about the sitter and the discarnate before, during, and after the reading and asked questions about the discarnate's appearance, personality, activities, and cause of death; (2) the sitters did not hear the readings as they occurred; they scored blinded transcripts of two readings, one for their discarnate (target) and one for another sitter's discarnate (decoy) without knowing which was which; (3) the experimenter who consented and trained the sitters (Experimenter 1) was blinded to which mediums read which sitters and which readings were intended for which sitters; (4) the experimenter who interacted with the mediums during the phone readings and formatted the readings into item lists for scoring (Experimenter 2) was blinded to information about the sitters and the discarnates; (5) the experimenter who interacted with the sitters during scoring (i.e., e-mailed and received by e-mail the blinded readings; Experimenter 3) was blinded to all information about the discarnates, to which medium performed which readings, and to which readings were intended for which sitters.

From the quintuple-blind readings that were assessed during that study, usable scoring data from 21 readings included item-by-item accuracy scores of mediums' responses to specific questions about the discarnate. A detailed examination of the item scores for the question types was outside the scope of the original study (which grouped item scores for all questions together). The current project supported a deep re-analysis of the item scores by breaking them out by question. The questions asked of the mediums by the proxy-sitter/experimenter during the blinded phone readings were:

1. What did the discarnate look like in his/her physical life? Provide a physical description of the discarnate.
2. Describe the discarnate's personality.
3. What were the discarnate's hobbies or interests? How did she/he spend her/his time?
4. What was the discarnate's cause of death?

Sitters associated with the discarnates scored lists of individual formatted items from each of two readings: a target reading for them and a decoy reading for a different sitter. Each item received one of the following scores:

5: Obvious fit (used if the item is a direct or concrete hit that does not require interpretation to fit)

4: Fit requiring minimal interpretation (used if the item indirectly applies and needs minimal interpretation or symbolism to fit)

3: Fit requiring more than minimal interpretation (used if the item indirectly applies and needs a greater degree of interpretation or symbolism to fit)

2: Other fit (used if the item does not fit the named discarnate or the rater, but does fit someone else that the rater is/was close to and that is likely to be the subject of the statement)

1: No fit (used if the information is a concrete miss—is clearly wrong—or if it is information for which there is no reasonable interpretation)

0: Don't know (used if the rater does not understand the item or does not have enough information to judge its accuracy)

Percentage accuracy was calculated by tallying the number of items that received scores of 4 or 5 and dividing that total by the total number of items minus the items scored as 0's ( $(4's + 5's) / [total - 0's]$ ). Items the sitters were unable to score (0's) were removed from the analysis as it is common for mediumship readings to include items that require input from others or from a future time for sitters to be able to score them for accuracy. To prevent having to follow-up with sitters for an indefinite amount of time and potentially change collected data, scores of 0 are removed from the analysis. The portion of items scored as 0's and removed from the data analyzed in this study was roughly 3%.

Analyses involved combining all the participants' scores for target readings and comparing them using paired t tests to the scores for decoy readings. The reported results (Beischel et al., 2015) included the combined data from the four questions above plus a fifth question about the

discarnate's specific messages for the sitter: the five-questions sections of target readings received accuracy ratings significantly larger than those sections of decoy readings (paired t test; mean  $\pm$  SE: 52.8%  $\pm$  3.9% vs. 36.6%  $\pm$  3.8%, respectively,  $p=.002$ , Cohen's  $d=0.75$ ). Because not all readings in all pairs received scores from sitters, target vs. decoy analysis for each individual participant is not possible. The current study used the accuracy scores the blinded sitters gave their own (target) readings for each medium participant, averaged if there were two.

Some notes about this peer-reviewed accuracy scoring method: Similar to anomalous cognition/remote viewing decoy selection methods in which decoy images are chosen from categories orthogonal to the target image (e.g., May et al., 2012), discarnates in the previous study were paired to be dissimilar to ensure that comparisons of scores of target and decoy readings were meaningful. Because readings can be close to one hundred items each, asking raters to score each item in a reading for a target discarnate and also several randomly selected readings for decoy discarnates that may be similar to the target does not add any additional rigor or meaningful information that would make the participant burden worthwhile. In addition, the living sitters associated with the discarnates are the only people capable of assessing the accuracy of a potentially infinite amount of information related to the discarnate so they served as the raters during this study.

### ***Instruments***

The Index of Learning Styles© (ILS), the Barsch Learning Style Inventory (BLSI), and the Learning Channel Preference (LCP) were included in this study because they best reflect the characteristics of interest. Other instruments may include assessments of the study practices of students and issues such as note-taking methods and classroom preferences that are not relevant here. The instruments reflect previously established phenomenological elements of mediumistic communication (e.g., Beischel et al., 2017). The different instruments allowed for the examination of preferences regarding the content of the information as well as the sensory method for its acquisition. In addition, the established validity and reliability, low

participant burden, and open-source nature of the questionnaires will ideally encourage replication by other researchers.

**ILS.** The widely used Index of Learning Styles (Felder & Spurlin, 2005; Livesay et al., 2002) was developed at North Carolina State University and has been available to take online since 1997 ([www.webtools.ncsu.edu/learningstyles/](http://www.webtools.ncsu.edu/learningstyles/)). It demonstrates acceptable validity and reliability for characterizing learning preferences (e.g., Felder & Spurlin, 2005; Livesay et al., 2002). The ILS assesses four learning dimensions (visual/verbal, active/reflective, sensing/intuitive, and sequential/global) using a 44-item questionnaire which takes about 10 minutes to complete. Each dimension is associated with 11 binary forced-choice items, with each option (a or b) corresponding to one or the other category of the dimension (e.g., sensing or intuitive). The ILS returns a profile with directional scores of 1-11 for each binary category of the four dimensions with higher scores indicating greater preference for that dimension.

**BLSI.** The 24-item BLSI (Barsch, 1991) asks respondents to categorize as Often, Sometimes, or Seldom how often specific statements apply to them such as, "I enjoy working with tools" and "I follow oral directions better than written ones." Totals for Visual, Auditory, and Tactual items are then calculated. Though the BLSI has been translated and used by researchers all over the world who consider it "famous for its simplicity of language and format" and its face and content validity (Tayebi, 2017) and it has been used by more than forty institutions of higher education (Renou, 2008; e.g., Beck, 2007), the validity and reliability of the English version have not been specifically established. However, the current study was not examining learning preferences in educational settings and it was determined that the BLSI's ability to quantify sensory preferences was acceptable.

**LCP.** The LCP (30 items) was originally designed (O'Brien, 1989) to develop one's awareness regarding their learning style. Respondents indicate how often a statement applies to them (often applies, sometimes applies, or never or almost never applies) in the categories of Visual ("When trying to remember someone's telephone number, it helps me to get a picture of it in my mind"), Auditory ("I remember things that I hear, rather than things that I see or read"), and Haptic ("I don't like to read directions;



I'd rather just start doing"). Similar to the BLSI, the LCP is widely used though its validity and reliability have not been established. Its face validity was deemed adequate for this study.

For this study, the questionnaire items from the three instruments were replicated in a private online survey on Formsite.com, completed by the participants, and scored by the experimenters to ensure complete and accurate data collection. The translation of paper instruments to online forms, the age of the participants (no longer students), and for general clarity, certain questionnaire items were updated (see Appendix).

## **Analyses**

### ***Accuracy scoring data***

Descriptive statistics were calculated for each of the four questions and data were graphed to assess if data met statistical assumptions for the proposed analyses.

### ***Correlating accuracy with learning style and sensory preference***

Kendall's tau-b correlations were run to determine the relationship between accuracy and LS-SMP instrument scores. Accuracy scores for the four question types (continuous data, 0-100%) were correlated with ILS Active, Reflective, Sensory, Intuitive, Visual, Verbal, Sequential, and Global scores; BLSI Visual, Auditory, and Tactual Preference scores; and LCP Preferred Visual, Auditory, and Haptic Channel scores for each of the 12 participants. As this is a novel, exploratory study with a low number of participants, correcting for multiple comparisons in order to draw strong conclusions was not necessary and may have resulted in missing relevant trends.

## Results

The means of the 21 accuracy scores for each of the four question types varied (mean  $\pm$  SE; physical description: 53.9%  $\pm$  5.2%; personality: 67.0%  $\pm$  7.1%; hobbies: 49.4%  $\pm$  5.5%; and cause of death: 41.3%  $\pm$  6.5%; Table 1) but overlapping interquartile ranges on box-and-whisker plots established that no differences requiring further statistical analysis existed (Fig. 1).

TABLE 1

### Descriptive Statistics of Mediums' Percent Accuracy Scores when asked Specific Questions about the Deceased during 21 readings.

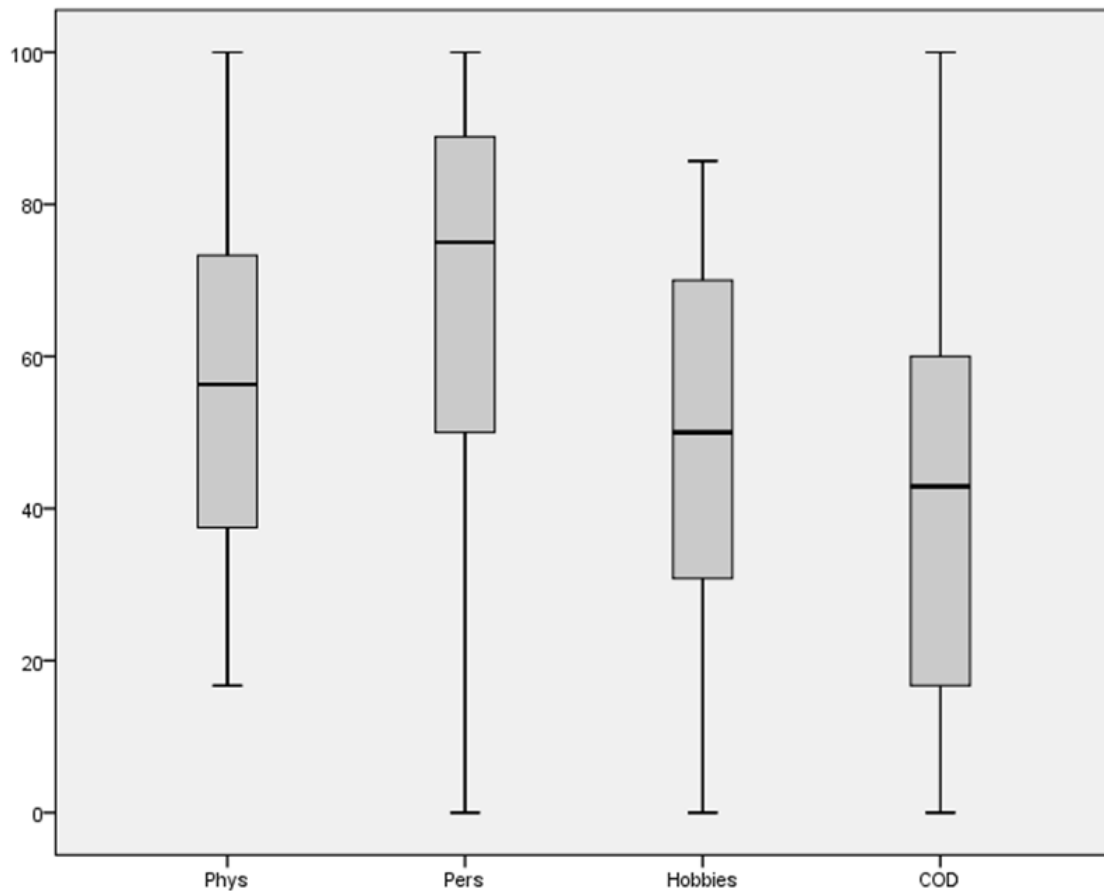
	PHYS	PERS	HOBBIES	COD
Mean	53.88%	67.02%	49.41%	41.25%
Standard Error	5.22%	7.10%	5.50%	6.53%
Median	56.25%	75.00%	50.00%	42.86%
Range	83.33%	100.00%	85.71%	100.00%
Minimum	16.67%	0.00%	0.00%	0.00%
Maximum	100.00%	100.00%	85.71%	100.00%

PHYS = Physical description. PERS = Personality. COD = Cause of death.

Although moderate correlations were found between the reading question types, no significant correlations were seen for accuracy and any of the 14 LS/SMP instrument scores: ILS Active, Reflective, Sensory, Intuitive, Visual, Verbal, Sequential, or Global scores; BLSI Visual, Auditory, or Tactual Preference scores; or LCP Preferred Visual, Auditory, or Haptic Channel scores (Table 2).

There were interesting trends not directly related to the accuracy-LS/SMP correlation analyses. The results from the ILS questionnaires indicated that the majority of the mediums were categorized as Reflective

(58.3% vs. Active), Intuitive (66.7% vs. Sensory), and Visual (83.3% vs. Verbal). Equal numbers were categorized as Global and Sequential. For the BLSI, the participants scored (min.: 8, max.: 40) an average of 27.2 on the Visual scale, 23.7 on the Auditory scale, and 20.3 on the Tactual scale. For the LCP, the participants scored (out of 30) an average of 24.3 on the Visual scale, 21.0 on the Auditory scale, and 18.5 on the Haptic scale.



**Figure 1.** Box-and-whisker plot comparing mediums' percent accuracy scores from 21 readings by question type.

PHYS = Physical description. PERS = Personality. COD = Cause of death.

TABLE 2

**Kendall's  $\tau_b$  correlation coefficients comparing accuracy scores and LS/SMP instrument scores.**

	<b>PHYS</b>	<b>PERS</b>	<b>HOBBIES</b>	<b>COD</b>
<b>PHYS</b>	--	.515*	.626**	.534*
<b>PERS</b>	--	--	.595**	.351
<b>HOBBIES</b>	--	--	--	.492*
<b>COD</b>	--	--	--	--
<b>ILS Active</b>	-0.112	-0.144	-0.097	0.032
<b>ILS Reflective</b>	0.112	0.144	0.097	-0.032
<b>ILS Sensory</b>	-0.426	-0.110	-0.254	-0.191
<b>ILS Intuitive</b>	0.426	0.110	0.254	0.191
<b>ILS Visual</b>	0.016	0.331	0.191	-0.095
<b>ILS Verbal</b>	-0.016	-0.331	-0.191	0.095
<b>ILS Sequential</b>	-0.226	0.194	-0.081	-0.342
<b>ILS Global</b>	0.226	-0.194	0.081	0.342
<b>BLSI Visual</b>	0.110	0.331	0.286	0.032
<b>BLSI Auditory</b>	0.205	0.331	0.191	0.064
<b>BLSI Tactual</b>	0.032	0.064	0.080	-0.304
<b>LCP Visual</b>	0.337	0.369	0.323	0.048
<b>LCP Auditory</b>	-0.016	0.277	0.131	0.000
<b>LCP Haptic</b>	0.344	0.375	0.331	0.331

PHYS = Physical description. PERS = Personality. COD = Cause of death.

ILS = Index of Learning Styles<sup>®</sup>. BLSI = Barsch Learning Style Inventory. LCP = Learning Channel Preference.

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

## Discussion

Though this sample size was not large, it may be appropriate to conclude from the data collected that none of the four types of information requested (physical description, personality, hobbies, or cause of death) is more or less difficult to acquire or report during a mediumship reading than any other. This finding is consistent with mediums' descriptions of their experiences as passive perceptions, rather than active cognitive processes (e.g., Beischel et al., 2017). If this is an accurate representation of the phenomenon, it is not surprising that accuracy levels would be similar across the four topics. Relevant analogies might include similarities in people's visual acuity when viewing different images or in hearing acuity when listening to different sounds. It seems logical that the mediums' perceptions were standard across topics. Indeed, the moderate correlations between the different question types supports this concept.

Mediums also describe their experiences during a reading as receiving rather than retrieving information about the deceased. Indeed, previous phenomenological research demonstrated that the volitional control of credentialed mediums (WCRMs) was significantly limited during a mediumship reading compared to a control condition (Rock & Beischel, 2008). Further research demonstrated that WCRMs experience the deceased as autonomous entities (Rock et al., 2009). One common theme specifically reported during additional phenomenological research with 122 claimant mediums was "not being in control" of communication with the deceased (Beischel et al., 2017, p. 79). The current finding that there were no differences in the accuracy of responses to the four types of questions is consistent with the information being conceptualized as independent of and simply interpreted by the medium.

Furthermore, individual characteristics categorized as learning styles and sensory modality preferences may not impact mediumistic abilities. Correlation analyses did not indicate any relationship between mediums' LS/SMPs and their accuracy scores when any of the four types of information was requested. This is consistent with findings that learning style

preferences are not correlated to learning, instructional method, or comprehension (e.g., Rogowsky et al., 2015). These findings are further consistent with the multi-modal nature of mediumship: multiple quasi-sensory modalities functioning concurrently or sequentially is a commonly reported theme of the mediumship experience (e.g., Beischel et al., 2017; Rock & Beischel, 2008); mediums see, hear, feel, smell, and taste things during a mediumship reading. It seems logical that individual sensory preferences are not related to these perceptions. Also, the previous phenomenological research discussed above suggests that mediums do not control the content, the timing, or the sensory modality of the information experienced during a reading. These issues imply that the sensory preferences of mediums during readings are irrelevant and make the current findings consistent with previous research.

Although it may appear that the group of participants in this study does not contain a balanced gender profile, American secular mediums have been demonstrated to be predominantly (~90%) female (e.g., Beischel et al., 2017) making this a representative sample. The sample size, however, may have resulted in limitations in our ability to control for confounding variables.

This study is relevant and important because we obtained novel data regarding the accuracy of four types of mediumistic information as well as the relationship of LS/SMPs to accuracy. Future research may wish to explore the relationship of LS/SMPs to the acquisition of different types of psi information (i.e., telepathic, clairvoyant, precognitive) that are not regularly experienced phenomenologically as autonomous.

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## References

- Barsch, J. (1991). *Barsch learning style inventory*. Academic Therapy Publications: Novato, CA.
- Beischel, J. (2007). Contemporary methods used in laboratory-based mediumship research. *Journal of Parapsychology*, 71, 37–68.
- Beischel, J., Boccuzzi, M., Biuso, M., & Rock, A. J. (2015). Anomalous information reception by research mediums under blinded conditions II: Replication and extension. *Explore*, 11(2), 136-142. <http://dx.doi.org/10.1016/j.explore.2015.01.001>
- Beischel, J., Mosher, C., & Boccuzzi, M. (2017). [Quantitative and qualitative analyses of mediumistic and psychic experiences](#). *Threshold: Journal of Interdisciplinary Consciousness Studies*, 1(2): 51-91. <http://www.tjics.org/index.php/TJICS/article/view/17/15>
- Beck, J. (2007). An exploration of the relationship between case study methodology and learning style preference. *Journal of Science Teacher Education*, 18(3), 423–430. <https://doi.org/10.1007/s10972-007-9056-5>
- Bem, D. J. (2011). Feeling the future: Experimental evidence for anomalous retroactive influences on cognition and affect. *Journal of Personality and Social Psychology*, 100(3), 407–425. <http://dx.doi.org/10.1037/a0021524>
- Cardeña, E. (2018). The experimental evidence for parapsychological phenomena: A review. *American Psychologist*, 73(5), 663–677. <http://dx.doi.org/10.1037/amp0000236> <https://psycnet.apa.org/record/2018-24699-001>
- Cardeña, E., Lynn, S. J., & Krippner, S. (2017). The psychology of anomalous experience: A rediscovery. *Psychology of Consciousness: Theory, Research, and Practice*, 4(1), 4–22. <https://doi.org/10.1037/cns0000093>
- Dunn, R. S., Dunn, K. J., & Price, G. E. (1975). *Learning style inventory*. New York, Lawrence, KS: Price Systems.
- Emmons, C. F., & Emmons, P. (2003). *Guided by spirit: A journey into the mind of the medium*. Lincoln, NE: iUniverse.
- Felder, R.M., Silverman, L.K. (1988). Learning and teaching styles in engineering education. *Engineering Education*, 78(7), 674–681.
- Felder, R. M., & Spurlin, J. (2005). Applications, reliability and validity of the Index of Learning Styles. *International Journal of Engineering Education*, 21(1), 103–112.

- Fleming, N. D. (2001). *Teaching and learning styles: VARK strategies*. Christchurch, New Zealand: N.D. Fleming.
- Kardec, A. (1861/2009). *The mediums' book* (translated by Kimble, D. W., & Saiz, M. M.). Brazil: International Spiritist Council.
- Kolb, A., Kolb, B. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *The Academy of Management Learning and Education*, 4(2), 193–212.
- Lake, W. W., Boyd, W. E., & Boyd, W. (2017). Learning styles terminology: What is the researcher talking about?. *International Journal for the Scholarship of Teaching and Learning*, 11(2), Article 2. <https://doi.org/10.20429/ijstl.2017.110202>
- Livesay, G., Dee, K., Felder, R., Hites, L., Nauman, E., & O'Neal, E. (2002). *Statistical evaluation of the index of learning styles* (session 2430). ASEE Annual Conference and Exposition, Montreal, Quebec, Canada.
- Mandikal Vasuki, P. R. M., Sharma, M., Demuth, K., & Arciuli, J. (2016). Musicians' edge: a comparison of auditory processing, cognitive abilities and statistical learning. *Hearing Research*, 342, 112–123. <http://dx.doi.org/10.1016/j.heares.2016.10.008>
- May, E. C., Faith, L. V., Blackman, M., Bourgeois, B., Kerr, N., & Woods, L. (2012). A target pool and database for anomalous cognition experiments. *Journal of Parapsychology*, 76(2), 94–103.
- Moreira-Almeida, A., & Lotufo-Neto, F. (2017). Methodological guidelines to investigate altered states of consciousness and anomalous experiences. *International Review of Psychiatry*, 29(3), 283–292. <https://doi.org/10.1080/09540261.2017.1285555>
- Neppe, V.M. (1993). Clinical psychiatry, psychopharmacology and anomalous experience. In L. Coly & J. D. S. McMahon, (Eds.), *Psi and Clinical Practice* (pp. 145–162). New York: Parapsychology Foundation.
- O'Brien, L. (1989). Learning styles: Make the student aware. *NASSP Bulletin*, 73(519), 85–89.
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105–119. <https://journals.sagepub.com/doi/pdf/10.1111/j.1539-6053.2009.01038.x>
- Persinger, M. A. (1983). Religion and mystical experiences as artifacts of temporal lobe function. *Perceptual and Motor Skills*, 57, 1255–1262.
- Renou, J. (2008). A study of perceptual learning styles and achievement in a university-level foreign language course. *Criso Lenguas*, 1(2), 1–15. <http://crisolenguas.uprrp.edu/Articles/JanetRenou.pdf>



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- Rock, A. J., & Beischel, J. (2008). Quantitative analysis of mediums' conscious experiences during a discarnate reading versus a control task: A pilot study. *Australian Journal of Parapsychology*, 8(2), 157–179.
- Rock, A. J., Beischel, J., & Cott, C. C. (2009). Psi vs. survival: A qualitative investigation of mediums' phenomenology comparing psychic readings and ostensible communication with the deceased. *Transpersonal Psychology Review*, 13(2), 76–89.
- Rogowsky, B. A., Calhoun, B. M., & Tallal, P. (2015). Matching learning style to instructional method: Effects on comprehension. *Journal of Educational Psychology*, 107(1), 64–78. <http://dx.doi.org/10.1037/a0037478>
- Roxburgh, E. C., & Roe, C. A. (2013). “Say from whence you owe this strange intelligence”: Investigating explanatory systems of spiritualist mental mediumship using interpretative phenomenological analysis. *International Journal of Transpersonal Studies*, 32(1), 27–42.
- Si Ahmed, D. (2017). René Warcollier. *Psi Encyclopedia*. <https://psi-encyclopedia.spr.ac.uk/articles/rene-warcollier>
- Sternberg, R. J., & Grigorenko, E. (2001). A capsule history of theory and research on styles. In R. J. Sternberg & L.-F. Zhang (Eds.), *Perspectives on thinking, learning, and cognitive styles* (pp. 1–21). Mahwah, NJ: Lawrence Erlbaum.
- Tayebi, G. (2017). The impact of rote learning on vocabulary learning: The case of Iranian EFL learners with visual and auditory learning styles. *Journal of Studies in Learning and Teaching English*, 6(1), 133–149.
- Willingham, D. T., Hughes, E. M., & Dobolyi, D. G. (2015). The scientific status of learning styles theories. *Teaching of Psychology*, 42(3), 266–271.

## Appendix

Changes made to the instruments for use in this study.

### **Index of Learning Styles (ILS)**

Original instructions were changed from:

*Circle “a” or “b” to indicate your answer to every question. Please choose only one answer for each question.*

*If both “a” and “b” seem to apply to you, choose the one that applies more frequently.*

to:

*Instructions: Click the button next to “a” or “b” to indicate your answer to every question. Choose only one answer for each question.*

*If both “a” or “b” seem to apply to you, choose the one that applies more frequently.”*

### **Barsch Learning Style Inventory (BLSI)**

Changed items and text:

Changed from:

*Please check the appropriate line after each statement.*

to:

*Instructions: Click the appropriate button after each statement regarding whether it is true for you often, sometimes, or seldom.*

Changed from:

*11. I do better in class by listening to lectures.*

to:

*11. I do better at academic subjects by listening to lectures.*

Changed from:

*12. I find myself playing with coins or keys in pocket.*

to:

*12. I find myself playing with coins or keys in my pocket.*

Changed from:

*14. I understand a news article better by reading about it in the paper than by listening to radio.*

to:

*14. I understand a news story better by reading about it in the paper than by listening to the radio.*

Changed from:

15. *I chew gum or snack during studies.*

to:

15. *I chew gum or snack while studying.*

Changed from:

20. *I find myself tapping my pencil during lecture.*

to:

20. *I find myself tapping my pencil during lectures.*

Changed from:

22. *I obtain information on an interesting subject by reading books from the library about it.*

to:

22. *I obtain information on an interesting subject by reading books about it.*

Changed from:

23. *I feel comfortable with physical contact highfiving, hugging, handshaking, etc.*

to:

23. *I feel comfortable with physical contact: high-fiving, hugging, shaking hands, etc.*

### **Learning Channel Preference (LCP)**

Instructions were changed from:

*Read each sentence carefully and consider whether it applies to you. On the line, write:*

*3 often applies*

*2 sometimes applies*

*1 never or almost never applies*

to:

*Instructions: Read each sentence carefully and consider whether it applies to you.*

*Then click the appropriate button.*

Button options:

*often applies*

*sometimes applies*

*never applies*

The sections were listed as “Section 1,” “Section 2,” and “Section 3” rather than “Visual,” “Auditory,” and “Haptic”

In the Auditory section (Section 2), the comma was added in the item “2. To memorize something, it helps me to say it over and over to myself.” “6. I like to record things and listen to the tapes.” was changed to “6. I like to record things and listen to the recordings.” “7. I’d rather hear a lecture on something than have to read it in a textbook.” was changed to “7. I’d rather hear a lecture on something than have to read it in a book.”

In the Haptic section (Section 3), “4. I solve problems more often with a trial-and-error, than a step-by-step approach.” was changed to “4. I solve problems more often with a trial-and-error approach than a step-by-step approach.” “5. My desk and/or locker looks disorganized.” was changed to “5. My desk and/or personal space looks disorganized.”

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