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摘 要

关键词

分类号 B842; B845

Cherry (1953)

(Du, Kong, Wang, & Li, 2011; Schneider, Li, & Daneman, 2007),

1

(1953)

(unmasking) (fine structure) (Huang, Xu, Wu, & Li, 2010; Yang et al., 2007) (Wu, Cao, Wu, & Li, 2013; Wu et al., 2013; Wu, Zheng, Li, Wu et al., 2017; Wu, Zheng, Li, Zhang et al., 2017)

(Wu, Cao et al., 2012; Wu Li et al., 2012; Wu, Zheng, Li, Wu et al. 2017; Yang et al., 2007)

(Huang,

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Huang, Chen, Wu, & Li, 2009; Li, Daneman, Qi, & Schneider, 2004; Li, Kong, Wu, & Li, 2013; Wu et al., 2005)

(intelligibility)

( , Wu, Zheng, Li, Wu et al., 2017; Wu, Zheng, Li, Zhang et al., 2017; Zheng et al., 2016),

( )

( , Ding & Simon, 2012; Mesgarani & Chang, 2012; Moon et al., 2014; Power, Foxe, Forde, Reily, & Lalor, 2012; Scott & McGettigan, 2013),

(Wu, Zheng, Li, Wu et al., 2017; Wu, Zheng, Li, Zhang et al., 2017; Zhang, Lu, Wu, & Li, 2014; Zheng et al., 2016);

(Du, He et al., 2011)

( Wu, Zheng, Li, Zhang et al., 2017; Wu, Zheng, Li, Wu et al., 2017; Zheng et al., 2016)

**2**

( )

“ ” ? (binding problem)

Treisman Gelade (1980) (the feature integration theory, FIT)

(Burwick, 2014; Feldman, 2013; Spence, 2011; Velik, 2012; von der Malsburg, 1999)

**2.1**

(tonotopic organization)

“ ”

(Hilbert transform)

(Hilbert, 1912)

(envelope)

(temporal fine structure, TFS)

Moore, 2008)

(harmonic structures)

modulation)

(frequency modulation)

(periodic occurrences of noise-like consonants)  
 (Huang et al., 2011) Smith, Delgutte  
 Oxenham (2002) ,

( ),

,  
 (where) (what) ( Zeng et al., 2004)  
 “ ” ,

effect, Huang et al., 2011; (precedence  
 Li & Yue,  
 2002)  
 (echo threshold),

(Li & Yue, 2002)

(Huang et al., 2011),

**2.2** ( )  
 ,  
 ( )  
 (time  
 varying) “ ” ,

(Huang et al., 2008,  
 2009, 2011; Li et al., 2004, 2013; Wu et al., 2005),

,  
 ( )  
 ( )  
 ( )

( ),

( 4.1)

(attribute capture) (Li, Qi, He,  
 Alain, & Schneider, 2005)

( ) ,

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**2.3**  
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“ ”,

3

3.1

( )

1)

2) (Event-Related Potentials, ERP) N1/P2  
(Zhang et al., 2014, 2016)

3) ( )  
(Li et al., 2004) N1/P2 (Zhang et al., 2014)

(Du, He et al., 2011)

3 ms ( )

3 ms ( ) (functional Magnetic Resonance Imaging, fMRI)

( )

(perceived spatial separation)

( )

(Li et al., 2004; Wu et al., 2005; Rakerd, Aaronson, & Hartmann, 2006; Freyman, Balakrishnan, & Helfer, 2008; Huang et al., 2009; Huang, Wu, & Li, 2009)

( $r = 0.568, p = 0.009$ )

(Fornito, Yoon, Zalesky, Bullmore, & Carter, 2011; Schulz, Bédard, Czarnecki, & Fan, 2011; Shenhav, Botvinick, & Cohen, 2013)

**3.2**

( )

(Vouloumanos, Kiehl, Werker, & Liddle, 2001), (Carreiras, Mechelli, Estévez, & Price, 2007) (Liu et al., 2006)

( Wu, Chen, Wu, & Li, 2014),

(default mode network, DMN)

(Andrews-Hanna, 2012; Raichle et al., 2001; Whitfield-Gabrieli et al., 2009; Zhang & Li, 2012)

(nonsense sentences),

(Freyman et al., 2008; Li et al., 2004; Wu et al., 2005; Yang et al., 2007)

(Zheng et al., 2016)

1)

; 2) ; 3)

( ) ; 4)

(the motor theory,

Wu et al., 2014),

( )

, ( )

( ) ( ) (Gao et al., 2014; Freyman,

- (Wu, Zheng, Li, Wu et al., 2017)
- ( $r = 0.512, p = 0.048$ )
- (Ahveninen et al., 2006; Boatman, 2004; Friederici, Rueschemeyer, Hahne, & Fiebach, 2003; Hickok & Poeppel, 2004; Rauschecker & Scott, 2009, 2015; Scott & Wise, 2003)
- (Snijders et al., 2009),
- (Papoutsi, Stamatakis, Griffiths, Marslen-Wilson, & Tyler, 2011; Tyler, Wright, Randall, Marslen-Wilson, & Stamatakis, 2010; Tyler, Cheung, Devereux, & Clarke, 2013).
- (Tong et al., 2005)
- (Arnott, Grady, Hevenor, Graham, &
- Alain, 2005),
- (Lau, Phillips & Poeppel, 2008)
- (Ali, Green, Kherif, Devlin, & Price, 2010; Ketteler, Kastrau, Vohn, & Huber, 2008; Li, Yan, Sinha, & Lee, 2008; Menon, Adleman, White, Glover, & Reiss, 2001),
- (Thompson-Schill, Bedny, & Goldberg, 2005),
- (Herholz et al., 1996; Papathanassiou et al., 2000; Paulesu et al., 1997; Rodd, Johnsrude, & Davis, 2012; Schuhmann, Schiller, Geobel, & Sack, 2009; Snijders et al., 2009)
- (Wu et al., 2014),
- 3.3** ( , visual speech)
- (Wu, Cao et al., 2013; Wu, Li et al., 2013; Wu, Zheng, Li, Zhang et al., 2017)
- (Summerfield,

2010) (Rodd et al., 2012) (Romanski, 2012) (Giraud & Truy, 2002)

“ ”

(temporal synchronization)

fMRI

(Wu, Zheng, Li, Zhang et al., 2017)

( )

( $r = 0.611, p = 0.012$ )

(1)

(2)

(3)

(4)

(1)

(Campbell et al., 2001; Ludman et al., 2000; Xu, Gannon, Emmorey, Smith, & Braun, 2009); (2) (Ranganath, 2006; Ranganath, Cohen, Dam, & D'Esposito, 2004; Woloszyn & Sheinberg, 2009); (3) (Giraud & Truy, 2002; Mummery et al., 1999; Vandenberghe, Price, Wise, Josephs, & Frackowiak, 1996; Wise et al., 1991); (4) (Chelazzi, Duncan, Miller, & Desimone, 1998; Chelazzi, Miller, Duncan, & Desimone, 1993; Zhang et al., 2011)

(Alain et al., 2005)

discrimination of speech sounds (Ikeda et al.,





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