



aprendizagem online

COMORBIDADES :

Síndrome de Irlen

Douglas de Araújo Vilhena

Coordenador do Laboratório de Pesquisa Aplicada à Neurovisão - UFMG/HOlhos

Mestre em Cognição e Linguagem - UFMG

Psicólogo - UFMG/University of Leeds

lapan.douglas@gmail.com

A Síndrome de Irlen

A Síndrome de Irlen é um transtorno neurológico que afeta a **adaptação à luz**, causando desequilíbrio no processamento neurovisual.

Dessa forma, a informação captada pelos olhos chega até o cérebro de forma distorcida, afetando todo o subsequente processamento da informação visual.

ONDULADO

When Sampler CPU 1 boots up "Code Meter" automatically loads. This is a Wibu application (free online from Wibu.com). This is essential to recognize the DVZ-RT/Space/Library authorization USB key (dongle). This may be immediately visible because it's in the Windows Task Tray. This runtime program is actually installed on all the DVZ-RT computers (Control and Samplers).

If the Code Meter task Tray icon is green, this means the authorization key is present on the computer being viewed. On those computers where the key is not installed, the icon will be gray, but it will work because the program accesses the valid key over the network.

Also, On all Samplers, you will see an AI Crypt VST Host (Helix) icon. That also loads automatically upon boot up. This AI Crypt info pertains only to beta turn-key systems, and will change later.

If the icon is not present, launch it from the desktop icon, or look in the Start Menu - Programs/Audio Impressions/AI Strings and launch AI Crypt. If it isn't there, it failed to load or the Wibu key is not connected so please make sure it's present on one of the computers, that they're all networked correctly together, etc.

If it's loaded, right-click on the icon and a context menu will come up. The first item will be Dismount if all loaded correctly. Don't select this. If the first item is "Mount" then select this (this mounts the library). If you Mount, you have to choose the image, and that's located on the sample drive and named "aisi" (Audio Impressions Symphonic Image). You select it and mount it to x (using the dropdown menu). No letter other than x will function correctly. Note: All this will occur automatically in the final release and even in beta you shouldn't have to do the mounting if the boot process works correctly.

A Síndrome de Irlen

Apesar dos sintomas prejudicarem diversas atividades do cotidiano (ex., dificuldade em andar de bicicleta, com escadas rolantes, assistir filme 3D), a leitura é a habilidade cognitiva que mais será prejudicada, pois a informação visual não chega até as regiões cerebrais de associação com adequada qualidade de imagem.

REDEMOINHO

Part of the answer may lie in the role of interest groups in the political process. The more complex the problem, the more complex the political process. The public is often reluctant to take action on a problem unless it is perceived as a clear-cut issue and the more willing the public is to accept the conditions of those policies, the more likely are the politicians to assume that a problem is so complex as to require a solution. Perhaps most important, the public is often willing to support a policy only if it is perceived as a solution to a problem that is clearly defined and the government is basically unopposed. Not surprisingly, as the public expects a complex and difficult social problem, such as aging, to become increasingly vulnerable to the actions of politicians and interest groups (Hollander, 1971).

Another aspect of the political process is that organizations frequently do not have jurisdiction over areas that are critical to their assigned responsibilities. Welfare agencies, for example, have little authority over the employment resources essential to getting their clients off welfare rolls. Organizational effectiveness is largely determined by organizational jurisdiction. As a scholar has described it: "The names for jurisdictional subdivisions constitute one of the most potent devices for divorcing organizational accomplishments from their symbolic evocations" (1977, p. 90). The Administration on Aging provides a classic illustration of this problem.

A related problem is that service strategies encourage the breaking down of policy interventions into specialized categorical services to meet individual needs, thereby increasing fragmentation of service provision and preventing an integrated attack on the multifaceted and complex problems of the old person. The specialization itself produces ever-growing classes of service-provider specialists, leads to continual conflicts between public and private agencies, and creates a requirement for administrative mechanisms to coordinate and coordinate the many different services and levels of care for which new needs are discovered or manufactured. Again, while the goal of the Older Americans Act was to coordinate services for the aged, the act has been largely ineffective in that regard. This is not to say that the act is ineffective in other respects. The act has many successes, including the establishment of many state and local aging councils, the establishment of a national network of area agencies on aging, and the establishment of a national network of state and local aging councils. The act has also been successful in the area of research and information. The act has been successful in the area of research and information. The act has been successful in the area of research and information.

A Síndrome de Irlen

A Síndrome de Irlen possui distintos sinônimos:

- Síndrome de Meares-Irlen
- Síndrome da Sensibilidade Escotópica
- Estresse Visual
- Transtorno neurovisual

A SI provoca dificuldade ou desconforto durante a leitura, mesmo na **ausências** de:

- problemas refrativos (ex., miopia)
- ortópticos (ex., estrabismo)
- cognitivos (ex., dislexia)

EMBAÇADO

BY ANDREW J. SOSTEK
AND RICHARD J. WYATT

As any parent, grandparent, or baby-sitter knows, some babies are adaptable, placid, and regular in their habits, while others are difficult and unpredictable. Differences in temperament show up from the first day of life: some infants sleep very little, others sleep a lot; some infants are highly sensitive and cranky, others are quiet and unresponsive.

Since newborns have not been exposed to the world for long, environmental factors beyond the womb can hardly account for such differences in temperament. Rather, the differences must be largely a result of genetic influences. Yet there have been few, if any, attempts to relate different biological endowments at birth to newborns' behavior.

We have found in research at the National Institute of Mental Health (NIMH) that behavioral differences in newborns are associated with an enzyme that circulates in both the blood and the brain, monoamine oxidase (MAO). By comparing the amounts of MAO in the blood of newborns with their performance on behavioral tests, we concluded that those with lower levels of MAO tended to be more excitable and crankier than those with high MAO. The lower-MAO newborns were also more reactive and performed better on items relating to motor functioning.

In the brain, researchers believe that MAO influences behavior by breaking down the chemical neurotransmitters that carry messages between neurons. By preventing neurotransmitters from building up, MAO quiets the brain cells that would otherwise be activated. Low levels of MAO thus mean more reactivity—higher arousal—in the brain.

We know that some of our colleagues at NIMH had already found a connection between levels of MAO and adult behavior. Dennis Murphy and his associates had found that nearly 50% of schizophrenic and depres-

sives had lower-than-normal amounts of MAO in their blood. In a study of normal adults, Monte Buchsbaum and his associates uncovered an association between low MAO and a variety of distinctive personality traits, including gregariousness, a tendency to drink and experiment with drugs, an active, varied sex life, and a preference for activities such as motorcyle riding.

Was MAO present in the blood of infants in the same relative amounts,



and could it similarly influence their behavior? To find out, we first examined the blood of 23 newborns. Some after birth, blood is routinely taken from the part of the infants' umbilical cord that is attached to the placenta to determine blood type. We received permission to analyze the remaining fetal blood.

We found approximately the same variation in the range of MAO levels among our 23 infants as among the 880 adults examined in previous studies. The MAO levels were also similar regardless of the type of delivery, race, gender, birth weight, or medication given the mother during delivery. Previous research has shown that the levels of MAO found in the blood of different people fall largely into 6 classes. For example, iden-

tical (same-egg) twins have very similar amounts and people in the same family generally have quite similar amounts. Thus, we assume that the MAO levels found in the blood at birth are biologically fixed.

To measure behavioral differences among our sample, we gave the Neonatal Behavior Assessment Scale (NBAS) to the 23 infants on their second day of life. The NBAS assesses infants' reactions to a range of sights and sounds and provides an evaluation of their motor functioning and arousal patterns. In one group of items, for example, the examiner rings a bell, shakes a rattle, and shines a flashlight at sleeping newborns to assess their ability to screen out stimuli; infants who wake easily or cannot stop responding are either more arousable or have less efficient information-processing skill.

To see how MAO related to the infants' NBAS scores, we compared the infants who had the most MAO to those with the least MAO. The most notable difference was in arousability. During the 30 minutes of testing, low-MAO newborns were much more active and easily aroused; they cried more often, took longer to consoled, and required more soothing and rocking to quiet down. They also displayed better muscular coordination.

Our research shows that one enzyme in the blood and brain seems tied to individual differences among newborns. We don't know whether other brain chemicals—such as the neurotransmitters—are present in sufficient quantities at birth and also influence infant behavior. It is also an open question whether these biological predispositions are constant throughout the life span—that is, whether the more active infants grow up to be outgoing sensation-seekers, while the placid ones become quiet, more introverted adults. □

Andrew J. Sostek is an associate staff fellow in the Adult Psychiatry Branch, National Institute of Mental Health Research, NIMH, National Institutes of Health.

A Síndrome de Irlen

RIOS

Principais manifestações da Síndrome de Irlen:

- **fotosensibilidade** (sensibilidade a luz)
- **distorções visuoperceptuais** (ex., embaçamento, letras em movimento, espaçamento irregular)
- **fadiga e lentidão progressivas** durante a leitura de textos (principalmente em fundo branco)
- **irritabilidade sob luz fluorescente**
- **déficit na percepção de profundidade**

([Irlen & Lass, 1989](#); [Loew & Watson, 2012](#))

However, by the end of the day he had decided that this school was better than the last one even though he didn't like it. Nobody had offered to pull his head off, rip his coat or throw his shoes over the roof. On the other hand, nobody had spoken to him either. By Thursday afternoon, nothing had changed. Bill was not entirely surprised no one spoke to him because no one knew he was there every day he was with another group. He only saw his class together at registration after that they were split up for all their lessons. Maths with lx English with lg games with 2ya lesson which was mysteriously called GS with lz. At the end of that period he was nowiser about GS than he had been at the beginning. It seemed that the class was on page 135 of book 2 while the teacher was on page 135 of book 3 as both books had identical covers the lesson was over before any one noticed Bill had had no book anyway being advised to share with a boy in a pink shirt who kept his elbow firmly between Bill and the book. When the bell rang Bill grabbed the boy in the pink shirt before he could leave. However, by the end of the day he had decided that this school was better than the last one even though he didn't like it. Nobody had offered to pull his head off, rip his coat or throw his shoes over the roof. On the other hand, nobody had spoken to him either. By Thursday afternoon, nothing had changed. Bill was not entirely surprised no one spoke to him because no one knew he was there every day he was with another group. He only saw his class together at registration after that they were split up for all their lessons. Maths with lx English with lg games with 2ya lesson which was mysteriously called GS with lz. At the end of that period he was nowiser about GS than he had been at the beginning. It seemed that the class was on page 135 of book 2 while the teacher was on page 135 of book 3 as both books had identical covers the lesson was over before any one noticed Bill had

A Síndrome de Irlen

AURÉOLA

As distorções visuoperceptuais mais frequentemente:

- sombras e halos (ver imagem ao lado) ao redor da palavra
- espaçamentos irregulares em meio ao texto
- percepção de movimento, como letras saindo do papel ou vibrando

([Stein & Walsh, 1997](#))

As principais manifestações somáticas são:

- cansaço visual
- dor nos olhos
- lacrimejamento
- Cefaleia

([Evans et al., 1996](#); [Kriss & Evans, 2005](#))

*We all see thing the same way.
We see WORDS in groups or phrases.
The print is more dominant than the
background. The print shows no
movement. The printed letters are
evenly black. Black print on
white paper gives the best contrast
for everyone. White background
looks white.*

*We all see thing the same way.
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Prevalência das distorções visuais



O trabalho "*Prevalência de distorções visuais na leitura em uma população clínica brasileira: Estudo de 1022 casos*" foi ganhador do Prêmio Dora Ventura no III Congresso Brasileiro de Neurovisão.

Local: Hospital de Olhos Dr. Ricardo Guimarães

Período: 02/2007 a 08/2015

Amostra: 1098 pacientes com Síndrome de Irlen

Crianças: n = 523, 07 a 12 anos

Adolescentes: n = 271, 13 a 17 anos

Adultos: n = 204, 18 a 69 anos

Instrumento: Irlen Perceptual Reading Scale (IRPS)

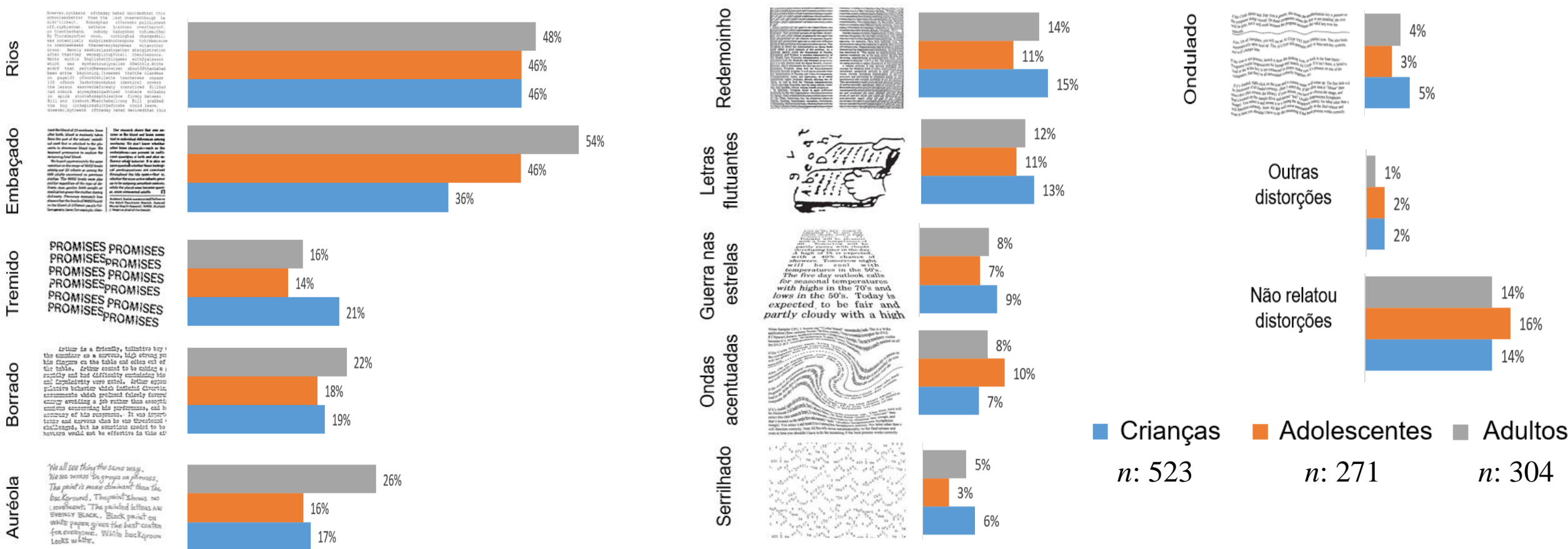
Resultados: Ver o próximo slide.

Discussão:

- **Embaçado** e **Rios** foram selecionadas por grande proporção da amostra, inclusive por pacientes com boa acuidade visual e sem problemas ópticos e ortópticos.
- Apesar das distorções **Serrilhado** e **Ondulado** apresentarem as menores ocorrências, 5 e 6% das crianças as selecionaram, justificando sua relevância na aplicação do IRPS.
- Apenas 14 a 16% dos pacientes não selecionaram nenhuma distorção visual, pois a população atendida já suspeita dos sintomas da SI ao se referir ao atendimento.
- Apenas uma pequena proporção dos pacientes (1 a 2%) relataram distorções além das oferecidas no IRPS, o que sugere uma adequada variedade de ilustrações no instrumento.

Prevalência de distorções visuais

O instrumento IRPS é o mais utilizado para fazer o rastreo da SI. A avaliação consiste na apresentação de imagens que provocam desconforto e cansaço visual com o objetivo de intensificar os sintomas da SI. Ao final da avaliação, apresenta-se onze ilustrações de possíveis distorções visuais durante a leitura.



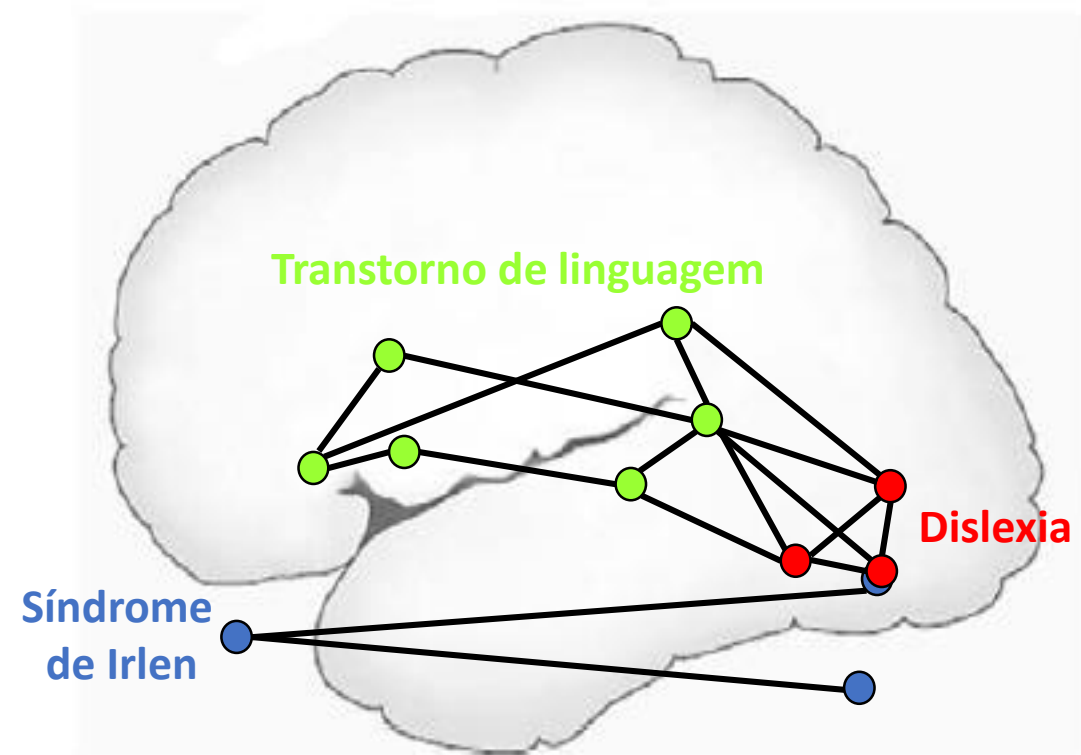
Processamento da linguagem e da leitura

Como se pode ver na figura ao lado, podemos distinguir anatomicamente a

- **Síndrome de Irlen** (processamento subcortical e região visual primária)

dos transtornos cognitivos:

- **Dislexia** (Região parieto-occipital, giro fusiforme) e
- **Transtorno de Linguagem** (TL) (Região fronto-temporal)



TL vs. Dislexia vs. Irlen

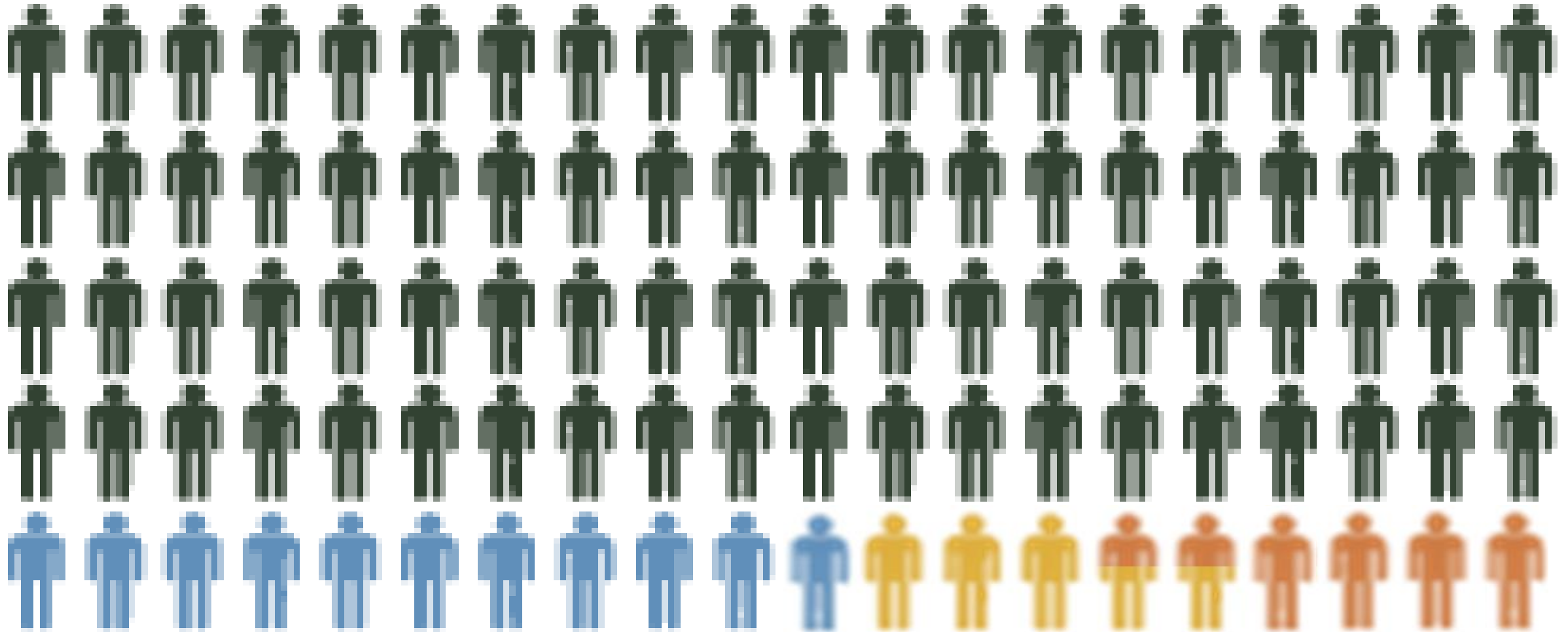
Transtorno de linguagem	Dislexia	Síndrome de Irlen
Distúrbio da linguagem oral	Distúrbio da linguagem escrita	Distúrbio visuoperceptual
Cognitivo	Cognitivo	Perceptual

Enquanto os Transtornos de Linguagem e a Dislexia estão no nível cognitivo, a Síndrome de Irlen está no nível perceptual.

Ou seja, a informação chega ao cérebro de forma inadequada, prejudicando o subsequente processamento cognitivo da informação.

Entre a população em geral, a SI afeta **severamente** de 2 a 5% de crianças e adultos, podendo coexistir com outros transtornos.

([Evans & Joseph, 2002](#); [Wilkins et al., 2001](#))



Dificuldade de leitura: 20%

Síndrome de Irlen Severa: 5%

Dislexia Severa: 5%

Existe dois tipos de tratamento da Síndrome de Irlen



- **Lâminas espectrais:** folhas coloridas de acetato transparente usadas sobrepostas no texto



- **Filtros espectrais:** bloqueio seletivo da luz aplicado nas lentes dos óculos (com ou sem refração)

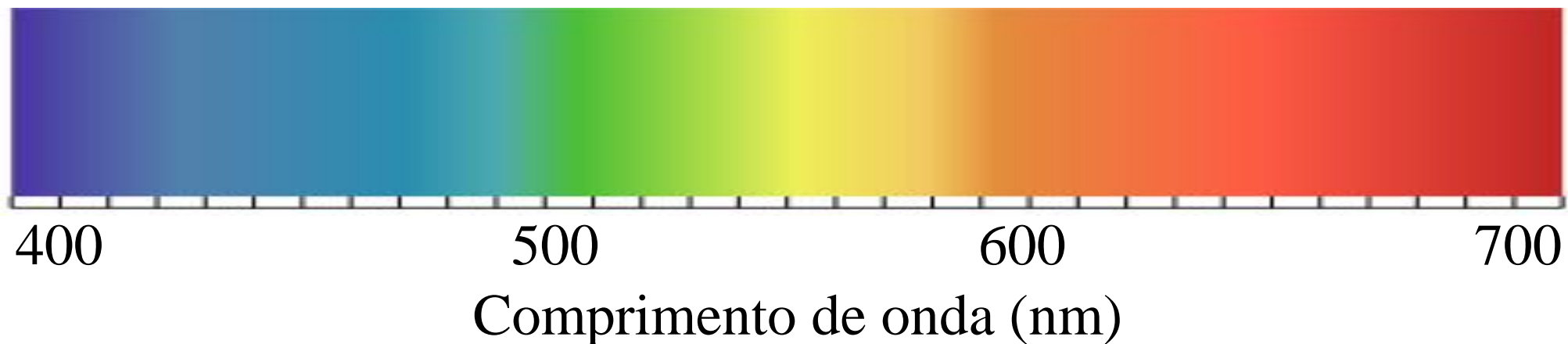
Causas: Espectro visível da Luz

O uso de cores para o tratamento da SI é embasado pela diferença no processamento neurovisual de acordo com distintos comprimentos de onda da luz.

Cores são ondas eletromagnéticas cores aptadas pela retina e interpretadas pelo cérebro.

O ser humano consegue perceber com comprimento de ondas entre 380 a 740 nanômetros (também chamado de espectro de luz visível), indo do violeta ao vermelho (veja imagem abaixo).

Dessa forma, quando um objeto é percebido como vermelho significa dizer que ele absorveu todos os comprimentos de ondas exceto o vermelho, que será refletido.



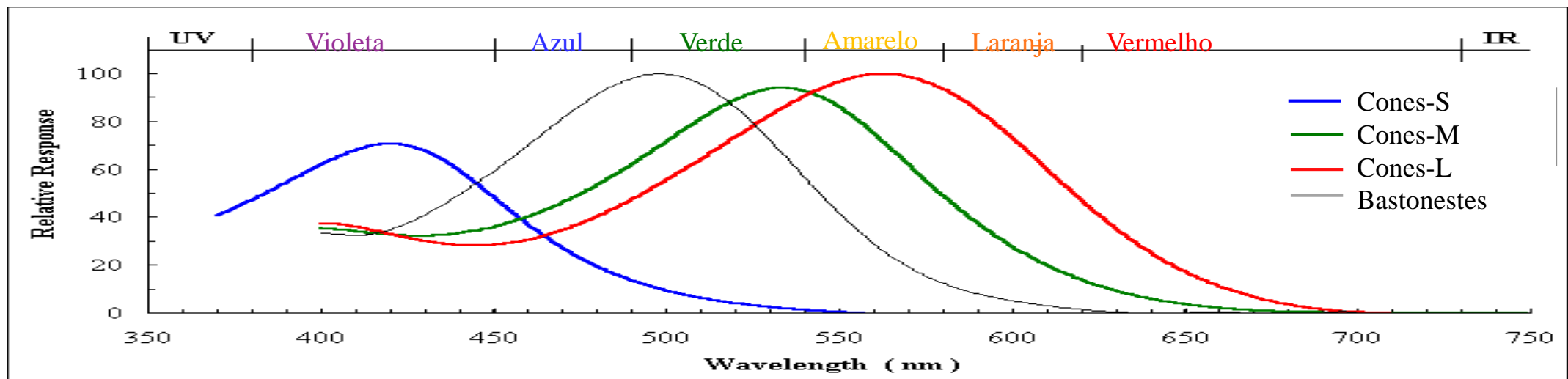
Causas: Captação da informação pela retina

Cones são 3 tipos de células fotorreceptoras da retina responsáveis pela percepção de cores:

- cones-L: respondem aos comprimentos de onda longos (verde-amarelado - pico aos 564 nm)
- cones-M: respondem aos comprimentos de onda médios (verde - pico aos 533 nm)
- cones-S: respondem aos comprimentos de onda curtos (violeta - pico aos 437 nm)

A ativação de distintos tipos de cones gera as cores secundárias, que por sua vez formam as cores terciárias, e assim por diante.

Essas concepções são essenciais para a compreensão do mecanismo de ação do tratamento da SI. No caso da lâmina espectral azul, ela irá absorver as cores primárias (vermelho e verde) com exceção do azul, que será refletido, estimulando apenas os cones-S. De forma distinta, quando se coloca uma lâmina com cor secundária, como por exemplo o amarelo, a cor azul será bloqueada, estimulando os cones-L e os cones-M, **redistribuindo a informação perceptual para o cérebro.**



Causa da SI

Assim como outros transtornos do neurodesenvolvimento (como o Transtorno do Espectro Autista, o TDAH e a dislexia) ainda não se sabe a **exata** causa genética e neuronal da SI.

Atualmente há duas teorias, não auto-excludentes, para explicar a SI no nível neuronal.

- **Déficit magnocelular:** ineficiente transmissão da informação até o cérebro
- **Hiperexcitabilidade cortical:** processamento difuso da informação na região visual primária

Essas duas teorias colocam a SI em um nível anterior ao processamento cognitivo da informação. Assim, a SI pode agravar ainda mais a leitura de pacientes com Dislexia, intensificando a irritabilidade de pacientes com Transtorno do Espectro Autista e a desatenção de pacientes com TDAH.

Três décadas de estudos sobre o uso das lâminas espectrais na leitura: revisão sistemática

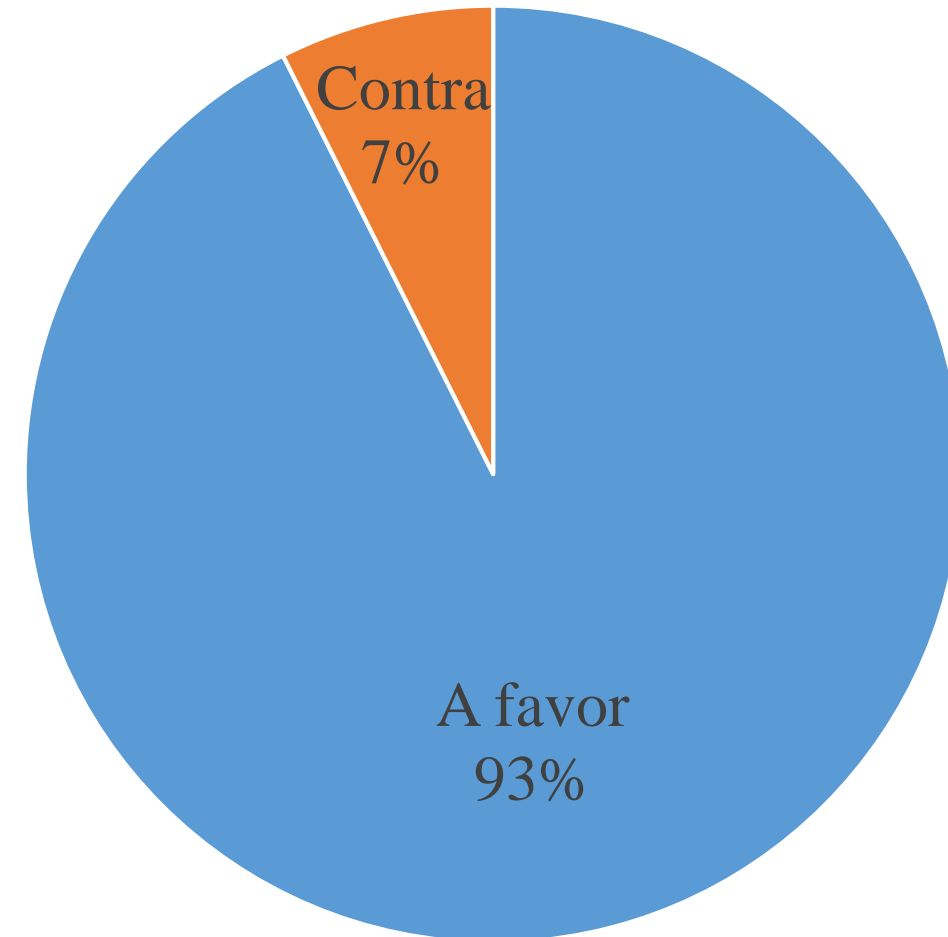
n = 54 estudos

Critério: Artigos científicos empíricos

Período: 1980 a 2015

Banco de dados: ERIC, PubMed, ScienceDirect, Scopus

Já há significativo acúmulo de estudos validando o tratamento da SI com o uso das lâminas espectrais, porém ainda poucos nos Brasil.



Estudo de Noble, Orton, Irlen e Robinson (2004)

Intervenção com as Lâminas Espectrais

- Estudo demonstrou que as Lâminas Irlen ajudaram crianças com SI a alcançar o nível adequado de leitura em **3 meses de tratamento**.
 - Demonstra que ao eliminar a dificuldade visuoperceptual, as crianças com SI possuem a capacidade cognitiva para obter bom desempenho escolar.
- Grupo controle apresentou ganhos negligenciáveis.
- No entanto, o grupo experimental chegou a um *plateau* após os 3 meses de intervenção.
 - Indica a necessidade de demais intervenções, como o uso dos filtros espectrooftálmicos.

A CONTROLLED FIELD STUDY OF THE USE OF COLOURED OVERLAYS ON READING ACHIEVEMENT



JEANNE NOBLE
McKinley Elementary School
Washington, USA



MICHELLE ORTON
Yakima School District
Washington, USA



SANDRA IRLLEN
Irlen Institute and
University of California
Los Angeles, USA



GREG ROBINSON
University of Newcastle
Newcastle, Australia

DICA: Será valiosa a adaptação e ampliação desse estudo no Brasil.

Síndrome de Irlen vs. Dislexia

Síndrome de Irlen \neq Dislexia

A seguir iremos contrapor a SI com a Dislexia.

Os sintomas dos dois transtornos irão se sobrepor em diversos pontos, pois **embora o processamento neuronal seja distinto, a expressão comportamental de ambos será a dificuldade de leitura.**

Síndrome de Irlen vs. Dislexia

Sintomas físicos

CARACTERÍSTICAS	SI	DISLEXIA
Ardência, coceira ou lacrimejamento nos olhos	X	
Fricciona ou esfrega os olhos frequentemente	X	
Pisca os olhos excessivamente	X	
Protege os olhos da luz durante a leitura	X	
Inclina a cabeça durante a leitura	X	
Rápidos sintomas de fadiga durante a leitura (± 15 minutos)	X	
Dores de cabeça, dores de estômago ou fadiga	X	X

Síndrome de Irlen vs. Dislexia

Padrão durante a leitura

CARACTERÍSTICAS	SI	DISLEXIA
Lentidão no aprendizado da conexão entre letras individuais e sons (grafema-fonema)		X
Vê textos com distorções e instabilidade	X	
Perde facilmente a localização do que está lendo	X	X
Pula palavras ou linhas	X	X

Síndrome de Irlen vs. Dislexia

Padrão durante a leitura

CARACTERÍSTICAS	SI	DISLEXIA
Leitura silabada		X
Faz leituras lenta	X	X
Mistura números em exercícios de matemática	X	X
Evita a leitura ou a interrompe frequentemente	X	X
Prefere leitura em ambiente com pouca luz	X	

Síndrome de Irlen vs. Dislexia

Percepção auditiva

CARACTERÍSTICAS	SI	DISLEXIA
Dificuldade em escutar e compreender as palavras		X
Dificuldade para seguir instruções verbais dadas rapidamente		X
Fraca consciência fonológica		X
Dificuldade em juntar sons para formar palavras		X
Dificuldade para perceber ou produzir rimas		X

Síndrome de Irlen vs. Dislexia

Produção da fala

CARACTERÍSTICAS	SI	DISLEXIA
Atraso para aprender a falar e linguagem verbal imatura		X
Mistura sílabas e erros sintáticos na fala		X
Dificuldades em nomear objetos familiares		X

Síndrome de Irlen vs. Dislexia

Produção da fala

CARACTERÍSTICAS	SI	DISLEXIA
Tamanho desigual de letra ou espaçamento	X	X
Dificuldade para escrever nas linhas	X	X
Predisposição a caligrafia ruim; evita escrever com letra cursiva	X	X
Escreve as palavras de cabeça para baixo ou espelhadas		X
Inversão da posição das letras, sílabas ou palavras		X

Síndrome de Irlen vs. Dislexia

Comportamento físico

CARACTERÍSTICAS	SI	DISLEXIA
Ser ambidestro (lentidão em definir uma das mãos)		X
Escrever com a mão esquerda		X
Fazer confusão entre esquerda e direita		X
Ser desastrado, propensão a quedas e acidentes domésticos	X	X
Inquietude ou falta de atenção	X	

Síndrome de Irlen vs. Dislexia

Atividades e Psicossocial

CARACTERÍSTICAS	SI	DISLEXIA
Dificuldade para aprender a dizer as horas		X
Dificuldade com sequenciamento (ex., alfabeto, meses do ano)		X
Histórico familiar de dislexia		X
Histórico familiar de sensibilidade à luz, dores de cabeça e enxaqueca	X	
Dificuldade para finalizar os deveres de casa	X	X
Predisposição à depressão, frustração ou raiva	X	X

Contato



lapan.douglas@gmail.com

Hospital de Olhos Dr. Ricardo Guimarães

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