

Potentially seizure provoking video sequences in Spanish TV: the smoking gun.

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Purpose

To analyse systematically the content of potentially seizure provoking video sequences from different Spanish television broadcasters checking for compliance with current guidelines in other countries. One in 4000 subjects is at risk of having a seizure when confronted with certain visual stimuli, often without being aware of their condition (1). Television is the most common cause of photosensitive seizures in the western world, but only the UK and Japan have adopted guidelines to prevent the broadcasting of video sequences that could potentially trigger seizures in susceptible people (1-4).

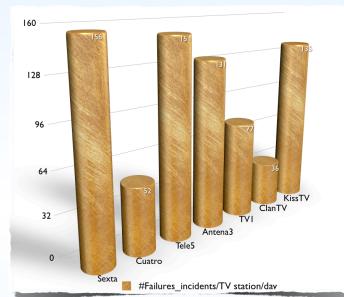
Methods

Television programs of all 5 national broadcasters available via Digital Terrestrial Television were recorded between 8 AM and 12 PM on 5 consecutive days, from January 1st 2012 through January 6th 2012. In addition, a channel with programming dedicated to children and a musical channel were also recorded.

The video content was analysed using a HardingFPA Flash and Pattern Analyser (Cambridge Research systems) for compliance with the UK Ofcom guidelines.

Results

We analysed 105 hours of television programs. We found 738 incidents that violated the guidelines (mean 105.43, CI95% 58.74-151.12), mostly luminance flashing (714 incidents, mean 102, CI95% 55.83-148.17).



Definitions

Flash Failure: $\geq 25\%$ of the video image area with ≥ 7 alternating transitions of $\geq 20\text{cd/m}^2$ over the last second. The magnitude of the failure is the sum of the absolute values of these transitions which is then logarithmically scaled from 0.5 (borderline failure) up to a maximum of 3.4.

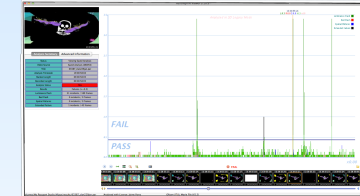
Extended Failure: if there is flashing above the 0.3 level (so close to the failure level) in more than 80% of the frames over the last 5 seconds

Results (II)

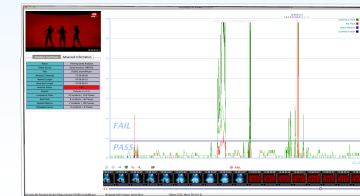
Thirteen incidents involved spatial patterns and 11 red flashing. Forty-seven additional incidents considered dangerous were detected which, although technically meeting guidelines, continued for an extended period of time and were considered dangerous.

TV station	Flash	Red flash	Spatial pattern	Extended failure
Sexta	154	2	0	0
Cuatro	48	2	2	5
Tele5	150	0	1	14
Antena3	130	1	0	12
TV1	76	0	1	12
ClanTV	31	0	5	3
KissTV	125	6	4	1

Spatial pattern failure: $>40\%$ of the video image area contains a regular striped structure containing ≥ 6 light-dark pairs of stripes of $\geq 20\text{cd/m}^2$ contrast which has remained stationary for $\geq 0.5\text{s}$. The magnitude of the spatial pattern failure is the weighted sum of the spatial frequency components (the most provocative spatial frequencies being given the highest weightings) which is then logarithmically scaled from 0.5 (borderline failure) up to a maximum of 3.4. The values of 1, 2 and 3 represent moderate, medium and severe violations.



Screenshot of the analysis of the channel with programs dedicated to children. Although the intensity of the stimuli was less than those of the musical channel, there were violations to patterns and luminance flashes.



Screenshot of the analysis of the musical channel. This channel had more red stimuli violations than any other analyzed channel.

Conclusion

Spanish broadcasters, seem to be unaware of the risk of photosensitive epilepsy. National Guidelines should be adopted to lower the risk of Spanish TV content triggering epileptic seizures in susceptible viewers. The International Standards Organisation is in process of adopting a Draft International Standard on image safety

References

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- Takahashi Y, Fujiwara T. Effectiveness of broadcasting guidelines for photosensitive seizure prevention. Neurology 2004;62:990-993.
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